

Graduate School of Business

**Consumer Attitudes for Sustainable Production Practices in
Western Australia**

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Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made. This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

Human Ethics (For projects involving human participants/tissue, etc) The research presented and reported in this thesis was conducted in accordance with the National Health and Medical Research Council National Statement on Ethical Conduct in Human Research (2007). The proposed research study received human research ethics approval from the Curtin University Human Research Ethics Committee (EC00262), Approval Number SOM-21-2012.

Signature:

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Abstract

Bread is a staple food in Australia, with the consumption of bread increasing throughout the world. Wheat is the leading grain produced, consumed and traded in the world, with a global production of 716 million tonnes in 2013. Wheat is a significant contributor to the Australian economy, generating more than \$4 billion annually.

Due to innovation, improvement of technology and increase in health awareness, the variety of bread available in the market is increasing. The changing consumer habits play an important role in bread consumption. Additionally, consumers are becoming more conscious of the environment and agriculture production, which has resulted in the increasing attention towards food purchasing.

This study explores the attitudes of consumers towards bread products, their knowledge of sustainable products and certification, and their willingness to pay for sustainable products. The theory of reasoned action and consumer behaviour were used to determine if the models play a role during the purchase of bread products. Data collection was conducted using structured a questionnaire collected from customers exiting Independent Grocers of Australia (IGA) stores within the Perth metropolitan area.

The results revealed that freshness, health, price and preference were the main attributes consumers use in their decision to purchase bread. Consumers were willing to pay a premium for quality products and products that are perceived to have improved environmental performance. Consumers are also willing to pay a premium when they had knowledge of the certification and were more health conscious.

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Chapter 1: Introduction

Australia is a country where bread and wheat-based products are produced and consumed on a daily basis. Australia is one of the world's largest wheat producers and exporters. Thus, conducting the research in Australia will be valuable to farmers and producers to measure the importance of sustainably produced foods and the increasing environmental concerns of consumers.

The importance of environment and agriculture production has been gaining attention in current food production. There has been an increasing number of sustainably produced products in the market at higher prices due to higher production costs. With sustainably-produced foods having advantages of better for the environment and prolonging agriculture production, this research will provide insights on consumer attitudes towards sustainable product purchases. Current environmental concerns will also be discussed to determine the importance of sustainability in agriculture.

With the increasing environment concerns of food production, food security and food safety, this study will identify the sustainable food market in Western Australia. This chapter will include the definition of sustainability, the processes and the importance of sustainability. This chapter will also cover the wheat and bread industry to provide more information on the market performance.

1.1 Background of research

Today, environmental concerns are growing with concerns of potential agro-chemicals used in food production which consumers perceive as a potential risk to health. Food products are highly sensitive consumer goods and are frequently in the spotlight and public discussions (Atreya, Johnsen and Sitaula 2012). With the increasing population growth (which may well approach nine billion by 2050), the environmental pressure for food production, food security and food safety have become important factors in sustainable food production. Due to the environmental impacts of food production on soil, water, air, and biodiversity (Morris 2000), there has been increasing concern for the welfare of people involved in the food production. These include their working conditions, as well as food security, health and nutrition (Sibbel 2012).

1.1.1 Aims

The aim of this study is to investigate consumer behaviour towards sustainably produced products. The research objectives of this study are to identify:

- consumer attitudes towards bread purchase;
- the importance of sustainability and attitudes towards sustainable food products in making the decision to purchase bread from a retail store;
- the consumer's willingness to pay for sustainable products and to support sustainable farming practices.

1.1.2 Attitude

Individuals are exposed to countless opportunities to purchase and consume to satisfy their needs and to express their identity and values. It is important for marketers to understand the processes of how consumer attitudes are translated into consumer behaviour. An attitude vary in strength and reflects consumer's values. Consumer attitudes are constantly changing, thus it is important to marketers to appeal consumers through marketing messages and appeals. Attitude leads to purchase intention which in turn leads to behaviour. Attitudes and consumer behaviour will be discussed further in Chapter 2.

1.2 Summary of Chapters

Chapter 2 is the consumer behaviour topic which will cover the consumer's decision process during the purchase of bread. This chapter will also include main factors involving the consumer's decision to purchase. Chapter 3 will cover the methodology of the research. This section will discuss how the research is conducted, including steps involved, in questionnaire design, and ethics approval. Chapter 3 also discusses how the data was collected and how the analysis was done.

Chapter 4 is the analysis of results from the data collected. The data is coded and cleaned. The results will explain the demographics, bread purchase and consumption, factors influencing bread purchase, food labels, sustainability and bread purchases.

Chapter 5 is the discussion of results. This section discusses the current research whilst comparing it to previous research studies conducted. This chapter will also discuss the limitations of the study.

Chapter 2: Review of Literature

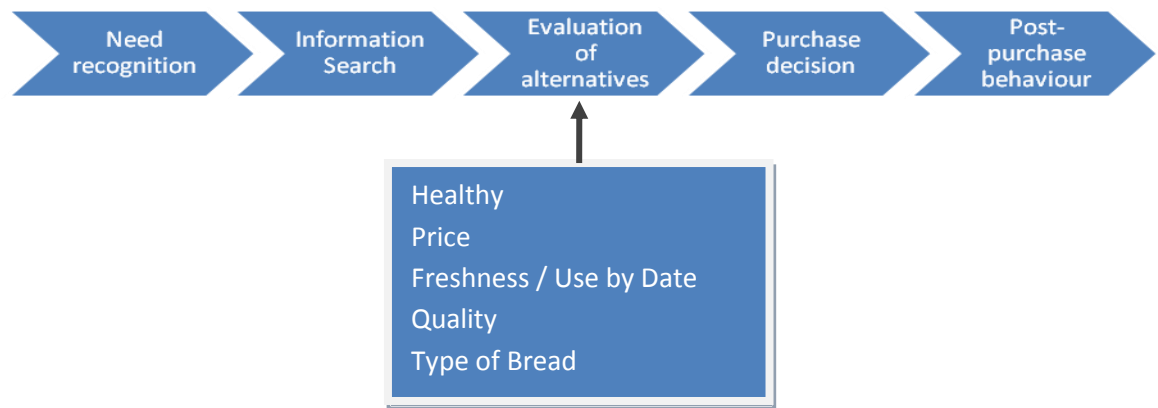
This chapter covers consumer behaviour and their decision-making process. During product purchasing, consumers usually go through a process of information search and evaluation prior to making a purchase. This chapter also discusses the variables consumers find important during the purchasing of sustainably produced products. Sustainability and willingness to pay for the sustainable product are also discussed in this chapter.

2.1 Consumer Behaviour

Buying behaviour is where individuals purchase goods and services for personal consumption. This behaviour involves a number of different people, playing different roles making specific purchases (Oxford Reference 2009). Kotler et al (2006, 576) defined consumer behaviour as “*the buying behaviour of final consumers, individuals and households who buy goods and services for personal consumption*”. Consumer behaviour is defined as “*the process involved when individuals or groups select, purchase, use, or dispose of products, services, ideas, or experiences to satisfy needs and desires*” (Solomon 2009, 647).

During the decision-making process, consumers take into consideration the five stages often used (Kotler et al. 2006, 169). These stages include: need recognition, information search, evaluation of alternatives, purchase decision and post-purchase decision (Figure 2.1).

Figure 2.1: Consumer Decision Process Model



Source: Kotler 2006, pg 169

Need recognition or problem recognition is the driving force behind consumer decision-making and purchase behaviour. It is the consumer's perception of the ideal state and actual state he or she is experiencing. Consumers build a tension and the desire to resolve his or her needs and wants.

Information search occurs after consumers recognise a problem or a need. Solomon (2009) defined information search as *"the process by which consumer surveys their environment for appropriate data to make a reasonable decision"*. Consumers will search for information internally through their memory, and/or externally by consulting others or going online.

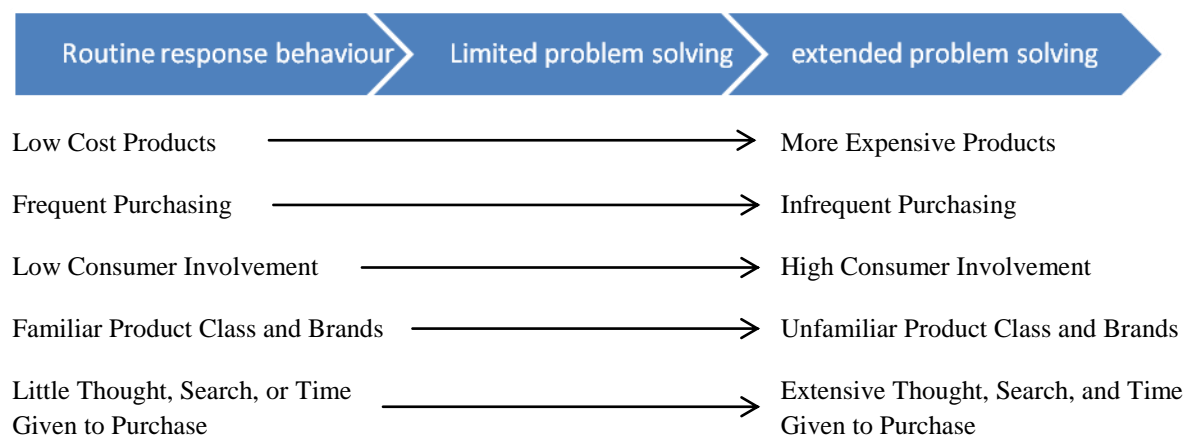
Evaluation of alternatives is the step where consumers determine the most suitable alternative that satisfies the need or problem. The alternatives are evaluated on a number of choices of criteria (brand, price, health) and reflect its importance to the overall judgement (image, attitude, preference). The choice can be highly dependent on the distinctiveness of the alternatives such as lifestyle and personality, culture or reference groups.

Purchase decision where the consumer decides on the product. After purchase, the product will be consumed and the outcome of the choice is assessed, known as the **post-purchase decision**. Satisfaction occurs when the product meets or exceeds a consumer's expectation; or dissatisfaction when the product fails to meet their expectations. Cognitive dissonance occurs when the consumer thinks whether their decision made was the right one.

Customer satisfaction depends on the difference between perceived and experience quality. If quality perceived is more or equal to expected quality, consumers will be satisfied. However, if the perceived quality is less than expected, customers will be unsatisfied. Customers who are satisfied with the purchase of the product will continue purchasing and at the same time, recommend the product to their friends and family (Espejel, Fandos and Flavian 2007).

During the consumer decision-making process, the type of product highly influences the decision-making process. In order to understand this process, we need to understand a number of factors consumers use to make a decision. Involvement and prior experience are the primary determinants of extensiveness in the decision-making process. Solomon (2009, 334) identified three types of buying behaviour. These are: (1) habitual decision-making; (2) limited problem-solving; and (3) extended problem-solving (Figure 2.2).

Figure 2.2: Consumer Problem Solving Model



Source: Solomon 2011, pg 335

Extended problem-solving usually involves a high level degree of information research, both from memory and external research. During this decision-making, consumers often initiate a careful process as decisions made are related to self-concept, and product involves high consumer risk levels such as economic, functional and psychological (Poulos 2001, 19).

Limited problem-solving is more straightforward and simple. Consumers have some knowledge of alternative products and have established a shortlist of

alternatives for consideration, and consumers need to make their choice, given those selected alternatives (Poulos 2001, 19).

Routine purchasing or habitual decision-making are choices that are made automatically with little thought. This is often a decision where the individual makes the purchase regularly.

Food products are considered routine purchasing as they are low cost, and do not involve a high degree of risk. During food purchasing, consumers do not involve in cognitive or emotional effort prior to purchasing (Insch and Jackson 2014). This was evident in the research conducted by Pelau (2011), where he found that bread was purchased as a habit by consumers. Swahn et al (2012) also supported that with low involvement products, consumers are most likely to make habitual purchases. Consumers do not spend much time during the purchase of bread. Consumers know the product well from experience and they do not differentiate too much among bread products. During the purchase of bread, consumers often purchase the same product without analysing it too much, nor are they being influenced by others. However, as discussed in the point above, consumers still pay attention to a number of factors during their product purchase. These factors influence their attitudes to purchasing and these factors are further discussed in their consumer behaviour.

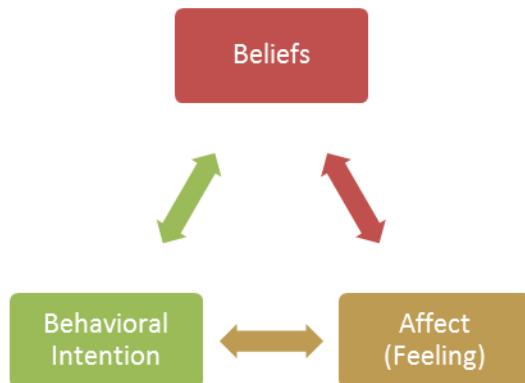
2.1.1 Consumer Attitude

Attitude is defined as “*a predisposition or a tendency to respond positively or negatively towards a certain idea, object, person, or situation*” (Business Dictionary 2016). Attitude influences an individual’s choice of action. Attitude is based on the elements, such as belief about the product, feelings (affect) about the product based on the belief, and the behavioural intention (Figure 1.1).

Consumer attitude is a variable of consumer behaviour, which is developed, and in relation to a purpose or reasoned intention of the consumer to react to a product (Anilkumar and Jelsey 2012). According to Anilkumar and Jelsey (2012), consumer attitudes are “*a composite of a consumer’s (1) beliefs, (2) feelings, and (3) behavioural intentions toward some object within the context of marketing*”. These

components are viewed together as they are highly dependent and represent forces that influence how the consumer reacts to the product (Figure 2.3).

Figure 2.3: Consumer behaviour model

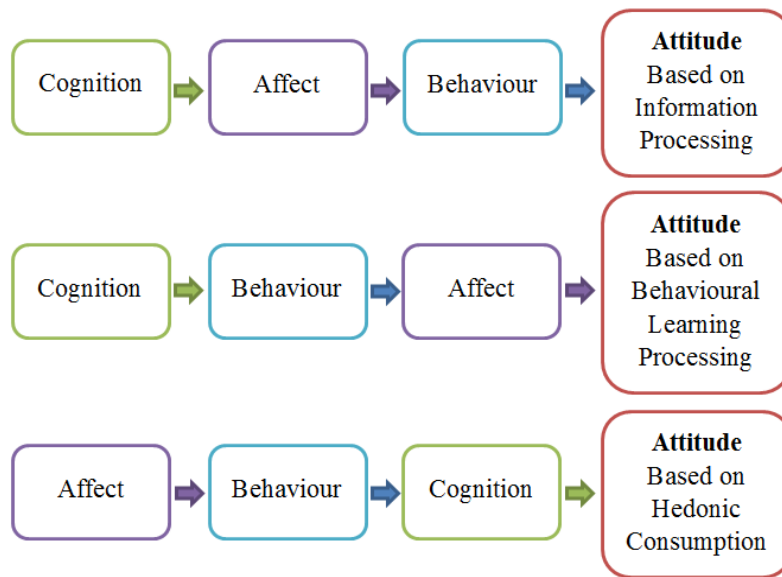


Source: Consumer Psychologist, 2010

There are three components in attitudes - affect, behaviour and cognition. **Affect** describes how consumers feel about an object. **Behaviour** refers to their intentions to take action on the object. **Cognition** is what consumers believe to be true about the object. For example, the consumer decides to purchase or not to purchase the product. **Behavioural intention** is sometimes a logical consequence of affect, but sometimes reflects other circumstances. For instance, the consumer does not like a restaurant but will go there because it is a hangout with friends. These components form the ABC model of attitude (Figure 2.3).

The ABC model (Figure 2.4) emphasises the relationships among the knowing, feeling and doing. Each element leads to different situations. These situations are developed using the hierarchy of affects to explain the attitude of these components.

Figure 2.4: Hierarchy of effects



Source: Solomon 2011, pg 283

The standard hierarchy (Think → Feel → Do) is used when the consumer approaches the product decision as a problem-solving process. Firstly, the consumer will form a belief about the product as knowledge (beliefs) regarding relevant attributes are accumulated. These beliefs are accumulated and form feelings (affect) towards the particular product. The consumer then engages in the behaviour, where the purchase is made on the attribute of how the consumer felt about the product. In this hierarchy, it is assumed that the consumer is highly involved in the purchasing decision. The consumer seeks a lot of information; whilst alternatives are being carefully weighed and it comes to the decision to purchase the product (Solomon 2011).

Low involvement hierarchy of effects (Do → Feel → Think) is used when the consumer doesn't have a strong preference for a particular brand over the other. The consumer acts on the limited knowledge formed after the product is purchased. This attitude is through the behavioural learning from previous choices or experiences (Solomon 2011).

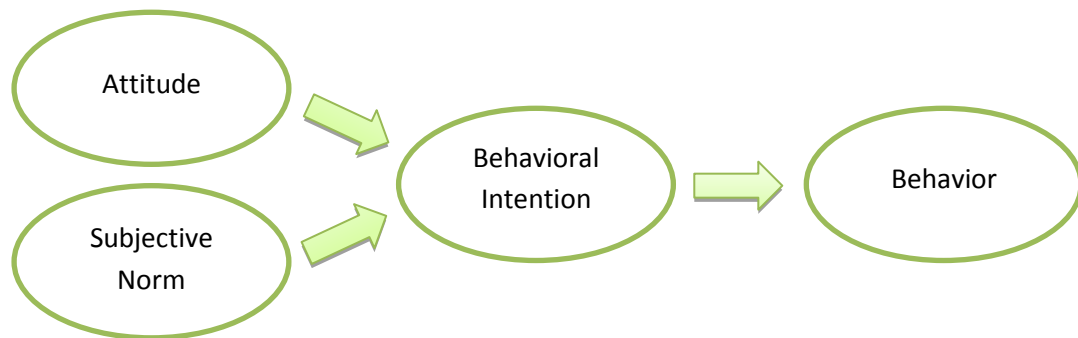
The experiential hierarchy (Feel → Think → Do) is used where an action is done based on emotional reactions. This hierarchy highlights the intangible product attributes such as the package design, advertisement, brand, and the nature of the

setting in which the consumer is experiencing that affects attitude towards the product.

2.1.2 Theory of Reasoned Action

The theory of reasoned action (Fishbein and Ajzen 1975) has been widely used as a model for the prediction of behavioural intentions and/or behaviour (Figure 1.3). The model appears to predict consumer intentions and behaviour well, and is useful for identifying where and how to target consumers' changing behaviour (Sheppard, Hartwick and Warshaw 1988). *“The theory of reasoned action posits that behavioural intentions, which are the immediate antecedents to behaviour, are a function of salient information or beliefs about the likelihood that performing a particular behaviour will lead to a specific outcome (Fishbein and Ajzen 1975)”*

Figure 2.5: Theory of Reasoned Action Model



Source: Madden, Ellen and Ajzen 1992, pg 4

Theory of Reasoned Action suggests that a person's behaviour is determined by their intention to perform the behaviour and that this intention is a function of their attitude toward the behaviour and their subjective norm. The behavioural intention is the predictor of behaviour. The intention is the cognitive representation of a person's readiness to perform a given behaviour, and it is considered to be the immediate antecedent of behaviour. This intention is determined by three things: their attitude toward the behaviour, their subjective norms and their behavioural intention. In addition to measuring attitudes toward the behaviour, subjective norms will also need to be measured. The more favourable the attitude and the subjective norm, the

person's intention to perform the behaviour will be stronger (Sheppard, Hartwick and Warshaw 1988).

2.2 Sustainability

With the rapidly increasing world population and the need to increase food production by 70%, the future of food and farming of “sustainable agriculture” was introduced. It was reported that sustainable agriculture will help reduce food poverty, ensure global food security and help the world to adapt and reduce the effects of climate change. However, despite the claims of what sustainable agriculture can achieve, there seems to be confusion over what sustainable agriculture is and how producers are expected to accomplish sustainable farming on their farms (Stocks 2012).

2.2.1 What is sustainability?

Over the last 50 years, agriculture practices have been transforming with the increased use of machinery during soil preparation, plantation and crop harvesting. These transformations have helped with the increased world food production. However, these practices have caused harmful effects to our environment, including air, water, soil and biodiversity with the increased use of resources and greenhouse emissions. Thus, sustainable agriculture was introduced using better management practices that protect soil, water and biodiversity (Hiranandani and Vanmala 2010).

Sustainable farming is a process in which agricultural practices move towards sustainability. The definition of sustainable agriculture is to have a farming practice that maintains yields with the increasing environmental benefits. Sustainability is associated with the increased efficiency use of resources (Stocks 2012). Reisch (2010) defined sustainable as *“to be safe and healthy in amount and quality; and it has to be realised through means that are economical, socially, culturally and environmentally sustainable – minimising waste and pollution and not jeopardising the needs of others”*.

With the high costs of mainstream food supplies to the environment, animal and human health, sustainability issues have gained momentum in the food industry worldwide. This has sparked growing interest in the origin of food, and in finding more sustainable options for current food production (Risku-Norja and Muukka 2013). According to Risku-Norja and Muukka (2013), sustainable food has been outlined as (1) meets both nutritional and hygienic quality requirements (2) basic food item is secured nationally and globally (3) producers receive fair compensation and basic food is affordable for everyone (4) food production fulfils the ethical norms regarding the welfare of the workers, production animals and the environment (6) natural resource bases of production are secured and environmental impacts are minimised (7) food is tasty - meals are composed by paying attention to the visual and aroma aspects.

2.2.2 Sustainable Farming Practices

Sustainable farming practices should integrate three dimensions, namely the environment, economic and social aspects. Environment sustainability is achieved through effective management of natural resources; economic sustainability is achieved by the ability to provide long term and stable incomes through job availability; and social sustainability is achieved through active community and society participation (Tatlidil et al. 2007).

Sustainable agriculture production is achieved by maintaining and improving the condition of natural resources - mainly practices that are both beneficial to the farmers, and reduce environmental impact. The sustainable farming practice is where the use of water is precise, and non-renewable inputs such as fossil fuel, chemical pesticides and fertilisers are minimised. Chemical fertilisers used in agriculture should be minimised due to the negative effects that are harmful to the soil, plant and animal. In large amounts, chemical fertilisers affect food safety. Sustainable farming practice also uses less fuel, resulting in less environmental pollution. An example approach to sustainable farming practice extensively used in organic farms was to reduce the use of chemical-based fertilisers and pesticides by substituting with renewable resources such as the application of compost or manure (Morse 2010).

Sustainable farming practices employ marketing practices that reduce the distance between production and consumption locations (Hiranandani 2010).

Sustainable agriculture encompasses a wide range of technology and practices including soil and water conservation, crop rotation, integrated pest management, composting, irrigation management, and organic farming. These techniques help reduce water waste, provide a reduction in pesticide use, and improve the productivity of pasture. Although it has been argued that the reduction in chemical use has reduced productivity, studies have shown that sustainable methods have increased yield by as much as 60% (Goodall et al. 2005). Thus, sustainable agriculture is proven to be more productive and ecologically sound.

Climate change concerns have also sparked government interest into policies that reduced greenhouse gas emissions. The most recent greenhouse gases reduction programs implemented is the carbon footprint, which is defined as “*the measurement of the total greenhouse gas emissions caused directly and indirectly by a person, organisation, event or product*” (Echeverria et al. 2011, 186).

2.2.3 Promoting Sustainability to Consumers

There are many ways to promote sustainability in the food market. The most common way of communicating sustainability through to consumers is with the use of labelling. In reference to studies conducted in Germany, the most widely-known and used sustainability labels were organic and fair trade labels. Organic represents the ecological dimension of sustainability, whilst fair trade labels represent the social dimension.

Sustainably produced foods and organic products can be easily confused. Organic is a common label understood by consumers as sustainably produced food. In order for a product to be certified *organic*, farmers must comply with specific standards developed by appropriate regulatory bodies. Sustainability is not a certified label and is not official. Sustainability is considered a philosophy that does not cause damage to the earth. Sustainability is water and energy efficient and is conducted in a humane manner (Royalty Pecan Farms 2015).

The European organic label guarantees the production of food is in accordance with the objectives and principles set in the Council Regulations. Organic food production is defined as “*sustainable management system*” and “*for farm management and food production that combines best environmental practices, a high level of biodiversity, the preservation of natural resources, the application of animal welfare standards and a production method in line with the preference of certain consumers for products produced using natural substances and processes*” (von Meyer-Hofer et al. 2014, 1083).

Fair trade label guarantees the trading of the food product is in accordance with the World Fair Trade Organisation standards. Fair trade is defined as “*a trading partnership, based on dialogue, transparency and respect, that seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalised producers and workers – especially in the South*” (World Fair Trade Organisation (WFTO) 2014).

2.2.4 Why are sustainable farming practices important?

Agriculture plays an important role in the economy. In order to ensure that food is secure, and stable income is available for future generation, the issue of sustainability development should be addressed for the rapidly growing population (Tatlidil et al. 2007). Environmental degradation, soil erosion, drought, salinity and infertile soils are increasing the call for farmers to adopt more sustainable farming practices (Kriflik and Yeatman 2005). Furthermore, the need to act on climate change is driving the push towards more sustainable food consumption practices (Horne 2009).

Sustainable farming is viewed to be an eco-friendly alternative to modern agriculture (Hiranandani, Vanmala 2010). Sustainability takes into account concerns whereby the resources will be able to last and will continue to be used by the future generation. Transitioning into sustainable farming also reduces the negative impacts of the production process on the environment. This is done with the reduced use of chemical fertilisers, reduced emission of pollutants, waste and deforestation (Nistor 2015).

2.3 Global wheat industry

Wheat has the widest adaptation of all grain crops and is grown worldwide. Wheat is the leading grain produced, consumed and traded in the world today, with the main producers being the European Union, followed by China, India, United States and Russia (Table 2.1). Worldwide wheat production has recorded global production of 716 million tonnes in 2013 (FAO 2015) (Table 2.1).

Table 2.1: World leading wheat producers

	2013	2014	2015	Change: 2015 over 2014
	Million tonnes			%
European Union	143.6	157.0	154.5	-1.6
China	121.9	126.2	129.9	2.9
India	93.5	95.9	88.9	-7.2
Russia	52.1	59.7	59.8	0.1
United States	58.1	55.1	58.1	5.4
Canada	37.5	29.3	24.6	-15.9
Pakistan	24.2	26.0	27.0	3.8
Australia	25.3	23.7	25.3	6.8
Ukraine	22.3	24.1	25.8	7.0
Turkey	22.1	19.0	22.5	18.4
Iran	14.0	14.0	14.0	0.0
Kazakhstan	14.0	13.0	14.0	7.7
Argentina	9.2	13.9	11.0	-20.9
Egypt	8.8	8.8	9.0	2.3
Other Countries	69.1	67.3	70.4	4.5
World	715.6	732.9	734.8	0.3

Source: Food and Agriculture Organization (FAO), 2015

2.3.1 Global wheat trade

Wheat is being traded globally, with the main wheat export countries being United States of America (29 Mt), Australia (20.9 Mt), European Union (22.7 Mt), Canada (19.4 Mt) and Russia (17.2 Mt) (Table 2.2). The major import countries of wheat are Egypt (10.2 Mt), Brazil (7.1 Mt), Indonesia (7.0 Mt), Algeria (6.8 Mt), Japan (6.1 Mt) and China (6.0 Mt). Russia, being one of the major exporters of wheat, has banned wheat export since 2010 after drought and wildfires rapidly reduced harvests (Bloomberg 2015). The ban was an option to balance domestic demand during the 2014-15 marketing season.

Table 2.2: Major wheat exports and imports

Imports	11/12-13/14 Average	Exports	11/12-13/14 Average (million tonnes)
Egypt	10.2	United States of America	29.0
Brazil	7.1	European Union	22.7
Indonesia	7.0	Australia	20.9
Algeria	6.8	Canada	19.4
Japan	6.1	Russia	17.2
China	6.0	Kazakhstan	8.1
European Union	5.4	Ukraine	7.2
South Korea	4.8		
Iran	4.6		
Mexico	4.6		

Source: Food and Agriculture Organization (FAO), 2015

2.3.2 Global Wheat Consumption

In the past four decades, global wheat consumption has doubled to approximately 650 million tonnes annually. Kazakhstan and Azerbaijan are the largest per capita consumers of wheat with consumption for food and industrial use of almost one kilogramme (Grain Growers 2013). The majority of world grain crops are consumed by developing countries (PwC 2014). The demand of wheat consumption is mainly driven by increasing economic development, population growth and higher protein diets. In September 2012, wheat was priced at \$371 per tonne, which was 13% higher than in September 2011. This was mainly due to lower productions with drought weather conditions (World Grain 2013).

China is the leading consumer of wheat (121 mega million tonnes). Due to drought during growing seasons and rain during harvest season, there has been a downward production in China. In 2012-13, China imported 3 mega million tonnes of wheat; Egypt imported 8 mega million tonnes of wheat, and Indonesia imported 6.9 mega million tonnes of wheat. Indonesia's wheat consumption has increased mainly due to their growing population and increasing wealth. Approximately two thirds of Indonesia's wheat imports are from Australia. Egypt is also another wheat consumer, and demand is expected to increase, although imports were down due to political unrest.

2.4 Australian Wheat Industry

Wheat is the staple food of almost half of the world's population and is one of the most important commodities produced by the Australian agriculture sector. Wheat has been cultivated since the beginning of European settlement more than 200 years ago. With the improvement of technology, the production of wheat has massively grown today. Research and development has allowed growers to breed high yielding, better quality and more resistant varieties of wheat (AWB 2012).

2.4.1 Growing wheat in Australia

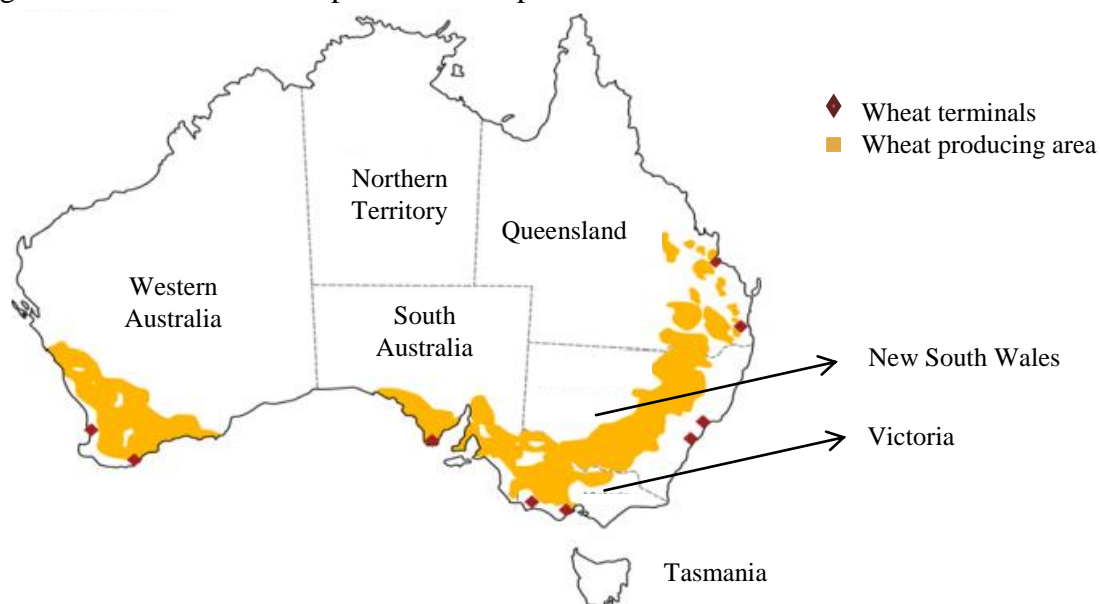
Wheat is grown in all states of Australia except the Northern Territory (Figure 2.6). Wheat is grown under a Mediterranean-type climate, characterised by moist winters and long dry summers, with rainfalls in autumn and spring. There are different soil types in different parts of Australia, thus different wheat varieties are grown according to the different growing conditions producing different types and qualities of wheat (Simmonds 1989). There is a wide variety of wheat seeds in Australia from which farmers can choose, suited to their specific production environment. The wheat variety ranges from quick growing, high yielding, resistant to particular disease, adaptation to levels of rain fall, and more (GRDC 2015).

Australian wheat is typically planted in autumn and grows during winter and spring. Winter and spring are wheat growing months and rain is required to ensure high production (Department of Agriculture and Water Resources 2015). Wheat crops are grown in rotation by growing different crops. Legumes are grown to put back nitrogen into the soil and increase the protein content of wheat grown. Crop rotation also helps with higher yield production and better protection from pest and disease (NSW Agriculture 1999). Wheat takes approximately five to six months to reach maturity where the crop turns golden in colour. Wheat is harvested quickly to minimise exposure to adverse weather which can impact yield and quality of wheat. Once harvested, the grains are stored and tested for quality.

Wheat plantation requires significant costs when planting the crop. The main costs include fertilisers, weed and pest control, machinery and fuel. Much of Australia's wheat production is stored on the farm. Farmers face two main risks: production risk

which is associated with the generation of crop, and price risk which is affected by market conditions (PwC 2014).

Figure 2.6: Australia wheat production map



Source: PwC, 2014

2.4.2 Australian wheat production and exports

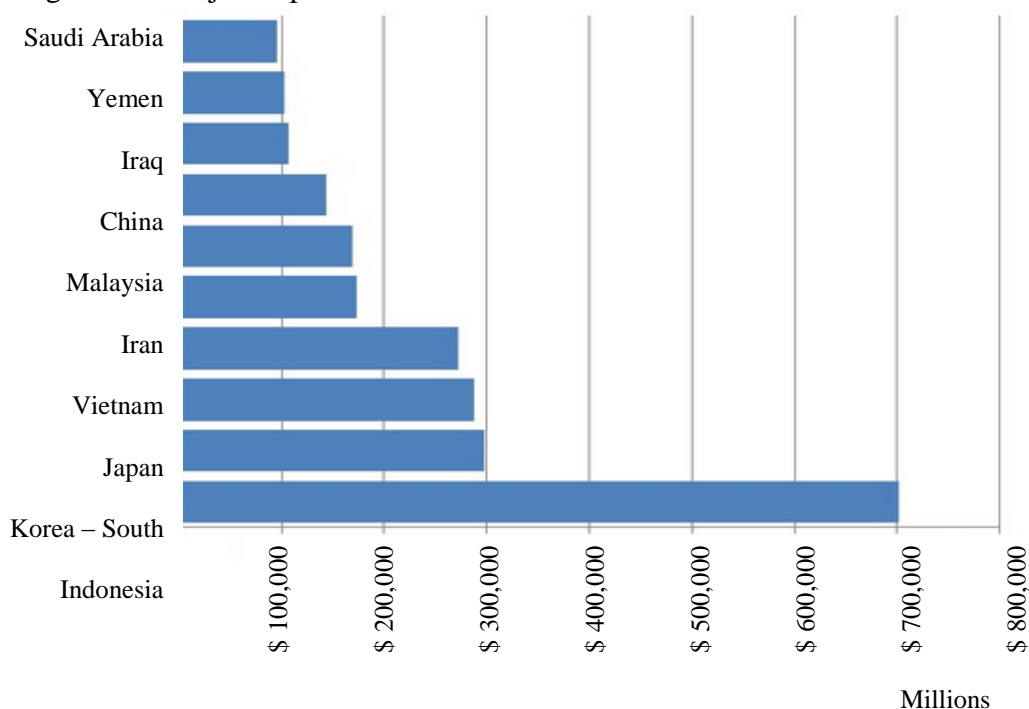
Wheat is one of Australia's biggest crops in terms of area used for plantation. Farmers planted 13.9 million hectares of wheat and wheat production was 27 million tonnes nationally. Western Australia produces most of the wheat production, followed by New South Wales and South Australia (ABS 2013).

Wheat is a significant contributor to the Australian economy and generates more than \$4 billion in revenue annually (AWB 2012). About 60% of Australian wheat is exported, with a relatively small domestic demand (Grain Growers 2013). Australia consumes around 5 million tonnes of wheat annually. Approximately 2.5 million tonnes are used for the production of flour, and products for human consumption. The remaining is used as stock feed (ABS 2014).

According to ABARES, wheat exports based on 2013/14 was 18.6MMT. Western Australia generates about 50% of Australia's total annual wheat production (Graintrade 2015) with more than 80% of produce exported to Asia and the Middle East (DAFWA 2013). Indonesia is the largest importer of Western Australian wheat,

accounting for an average 2.3 million tonnes each year, followed by South Korea, Japan and Vietnam (Figure 2.7).

Figure 2.7: Major Export Markets for Western Australian Wheat 2013/14



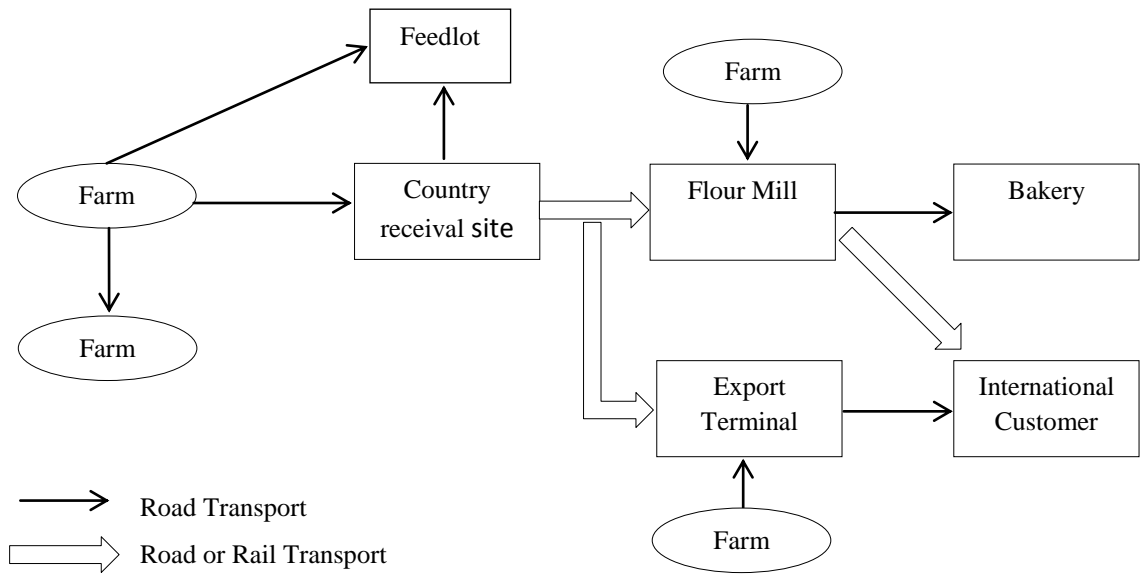
Source: Department of Agriculture and Food, 2015

It is estimated that 2.2MMT of flour production requires 2.7MMT of wheat. The largest demand for flour production is for human consumption which is required for baking, followed by the industrial uses of flour for starch and ethanol production (SFMCA 2015). According to SFMCA (2015), human consumption of flour production has increased over the years. Flour productions for industrial use remain steady, while exports of flour have decreased.

2.4.3 Australian Wheat: Supply Chain

In the Australian agricultural industry, wheat is transported from the farm and goes through a series of steps for processing (Figure 2.8). Farm produce goes through processing, packaging and is transported via road or rail freight. The storage and transport infrastructure is vital to cope with the volume of wheat produced. The major companies involved in storage and transport in Australia include GrainCorp (New South Wales, Queensland and Victoria), CBH (Western Australia) and Viterro (South Australia) (PwC 2014).

Figure 2.8: Grain Supply Chain (wheat supply chain)



Source: NTC 2014

2.4.4 Wheat quality processing

Wheat, once harvested is cleaned, fully matured and free from foreign materials. After cleaning, a small amount of each harvest is sent for wheat quality testing and grading. Wheat is tested on protein content, grain hardness, dough strength and milling quality of yield and colour. The wheat quality determines the price the farmers will be paid, as well as the suitable production type for which the wheat can be used (Simmonds 1989).

Wheat quality consists of different aspects: grain characteristics, milling quality, dough functionality and end product suitability. These characteristics can be identified by the physical attributes, chemical attributes, and genetic control or can be modified by growing conditions (GIWA 2014). After quality testing, depending on the quality, the wheat is milled into flour for consumption or used for feed.

2.4.5 Wheat Grade Types

Australian Wheat Belt (AWB) has developed six main wheat grades. The six wheat grades include Prime Hard, Hard, Premium White, Standard White, Soft and Durum (AWB 2012). Different types of wheat grades contain different protein content (Table 2.3) and are segregated and milled into different products due to its different quality performance characteristics. Protein content is an important criterion on which international wheat trade is based. Protein content is used as an indication of potential end uses of wheat (GRDC 2015).

Table 2.3: Wheat Grades Protein Content

Australian Wheat Grades	Protein %	Suitability
Australian Prime Hard Wheat	13% - 14%	Chinese style alkaline noodles, Japanese ramen noodles
Australian Hard Wheat	11.5%	Bread
Australian Premium White Wheat	10%	European and flat breads, noodles, steamed breads
Australian Standard White Wheat	Less than 10%	Flat breads, steamed (Asian breads, noodles
Australian Soft Wheat	9.5%	Biscuits, cakes, steamed buns
Australian Durum Wheat	13%	Pasta, couscous

Source: GRDC, 2015

2.4.6 Wheat Products

The major attribute of wheat grain is the high starch content of starch (60-70 percent), and gluten protein (10-15 percent). The gluten protein provides elasticity to the dough, allowing it to rise and entrap fermentation gases providing a leavening bread result (Malcolm et al. 2009, 100). Grain hardness also plays an important role in the type of product produced. Products of wheat flour are made into different food products including bread, pasta, noodles, biscuits, cakes and more depending on the quality. These products are then transported to supermarkets and bakeries where consumers can purchase them. The wheat quality of bread is usually judged on the basis of the ability of the flour milled to produce a high standard loaf of bread, which is highly dependent on the type of wheat grown (GRDC 2015).

With the increasing ethnic population within Australia, there is also a growing demand for wheat to be milled into other products of flat bread, sweet bread, steamed buns, and speciality Japanese noodles (AEGIC 2014) (Table 2.4).

Table 2.4: Major wheat flour end-product groupings

Breads	Noodles	Asian Dumplings	Biscuits	Cakes	Durum Products
Pan breads	Yellow alkaline	Chinese dumplings	Crackers	Sponge hi-ratio Madeira	Pasta
Hearth breads	White salted		Hard sweets	Fruit cakes	Couscous
Middle Eastern flatbreads	Instant		Cookies		
Indian flatbreads			Wafers		
Asian steamed breads and buns					
Tortillas					

Source: GRDC 2015

Flour supply and pricing factors can be highly volatile due the nature of wheat as the raw input ingredient, and production is affected by the seasonal weather conditions and other variables. The demand for flour and grain milled products remains relatively stable. There has been a shift in consumption patterns, as Australians are not increasing their consumption of flour-based products. The changing lifestyle and increase in health consciousness have stimulated the growth in demand for wholegrain and organic produce. The increasing health awareness has driven manufacturers for product innovation with the increasing domestic demand for value-added flour products including fortified, organic and unbleached flours.

2.5 The Australian Bread Industry

According to DAFF (2015), despite the growing awareness of high fibre diets, white bread accounts for the majority of bread sales (43%). Due to innovative and improving technology and increase in health awareness, the variety of bread available in the market is increasing (IBIS World 2015). The type of bread available in the market includes white bread, wholemeal, mixed grain and more. Bread is now also available in many different forms such as loafs, buns and rolls, crumpets,

flatbreads and more. Bread can now be produced with specific health attributes such as high fibre, high calcium, or omega-3. Bread can be made using different types of ingredients such as chia seed and lupin flour for its nutritional benefits. Manufacturers are also incorporating other non-conventional ingredients into bread, including raisins and nuts (DAFF 2015).

The changing consumer habits have an important impact on bread consumption. The average consumption of bread Australians eat has fallen from 64kg in the late 1950s to 53.5kg in the year 2000 (DAFF 2015). Bread still remains a staple food in the Australian diet. Traditionally, consumers based their bread purchasing on taste, quality, packaging, price and use-by dates. Due to the increasing public awareness of health and nutrition, consumers are constantly looking for low carbohydrates, high fibre and high protein diets. The change in increasing health awareness has resulted in consumers steering away from white bread consumption (IBIS World 2015).

Over the years, there have been significant changes in lifestyle and attitudes. Australian diets have become more diverse due to the increasing population and ethnicity where carbohydrate diets are substituted with rice and cereal, instead of toasts (The Australian 2010). There has also been increasing demands for convenience, health, taste and preference of bread products.

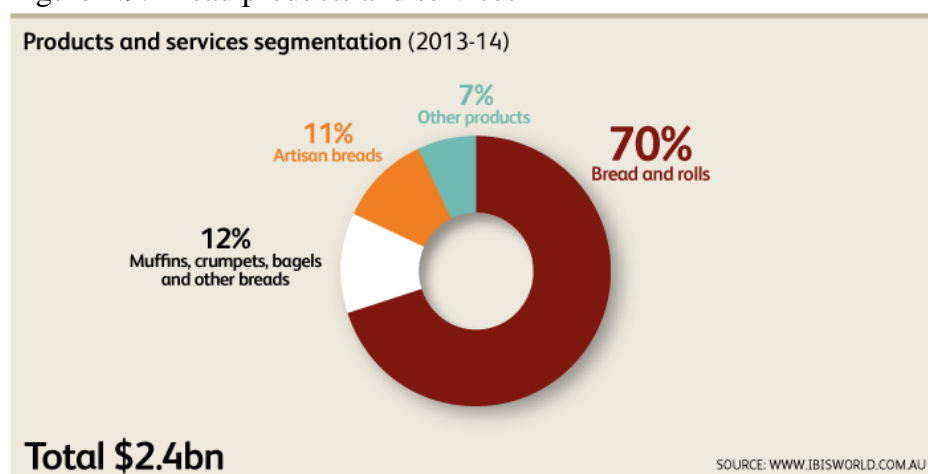
Innovation has played an important role in bread production and consumption as manufacturers introduced a healthy range of bread products. The introduction of healthier alternative includes nutritionally enhanced and fortified bread, and new varieties of bread such as sourdough, wholegrain, and mixed grain to target health conscious consumers.

Currently, the bread industry is facing an increasingly dynamic and evolving marketplace. Australians have become more sophisticated with their bread purchasing habits, opting for a greater variety including seeded, wholemeal, sourdough, rye, organic and gluten free loaves. Bread manufacturers are widening their product range to suit the changing consumer tastes and demands, at the same time steering away from the traditional white bread loaf (DAFF 2003).

The bread industry can be categorised into four groups: corporate plant bakeries, traditional hot bread shops, franchised bread shops and supermarket in-store

bakeries. In 2013-14, the bread industry revenue was estimated at AU\$2.4 billion. Bread and rolls dominate the total revenue (70%). Products such as muffins, crumpets, bagels and other bread have gradually increased in popularity and accounts for 12% of total revenue. The fastest growing product segment is artisan bread, accounting for 11% of the revenue, with its rapidly increasing popularity of sourdough bread, including rye and Turkish bread. Other bread products include bread dough, both fresh and frozen, and breadcrumbs accounted for 7% of the revenue (IBIS World 2014) (Figure 2.9).

Figure 2.9: Bread products and services

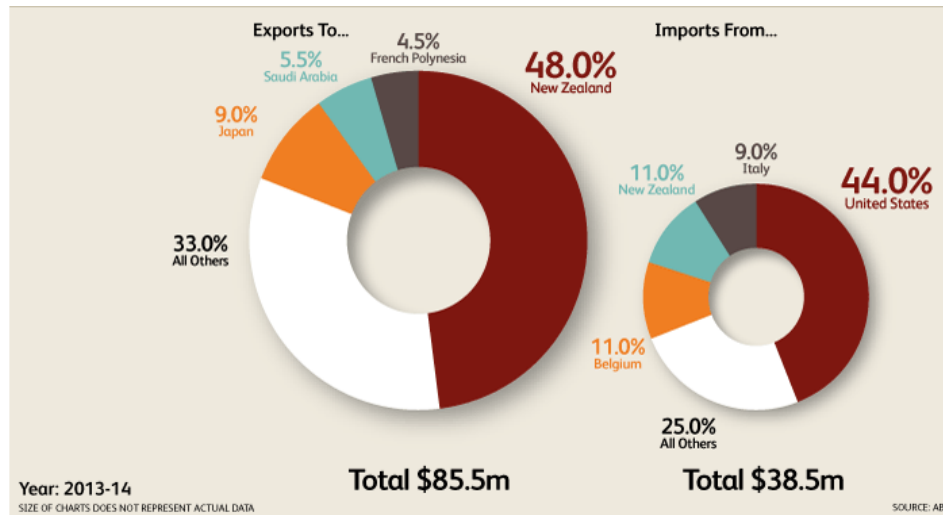


Source: IBIS World 2014

2.5.1 Australian Bread Imports and Exports

The Australian domestic market accounts for 95% of bread production and consumption. The perishable nature of bread and its short shelf life makes exporting bread highly unfeasible and expensive (DAFF 2013). The key export markets include Japan, Papua New Guinea, French Polynesia and New Caledonia. Like export, there is only a small amount of bread imported into because its short shelf life. The key import markets of bread include United States, New Zealand, Italy and Belgium (Figure 2.10).

Figure 2.10: Bread export and imports (Australia)

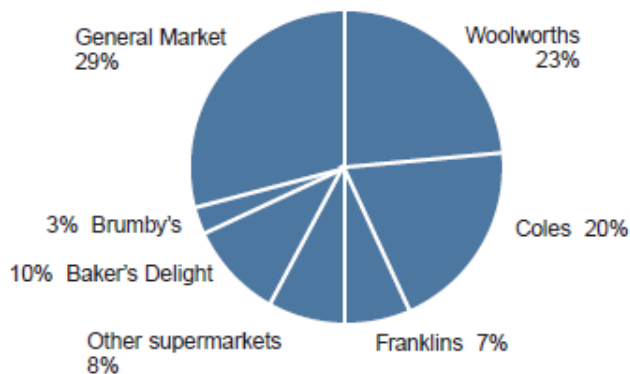


Source: IBIS World 2014

2.5.2 Australian Bread Market

The Australian bread industry is currently facing high competitive pressures in the bread industry. This is mainly due to grocery retailing giants such as Woolworths and Coles generating price wars of \$1 bread prices. In 2001, almost half of the bread sales were made through supermarket Coles and Woolworths (Figure 2.11). In order to distinguish their products from competitors, manufacturers incorporate new products through differentiation and innovation. This is done by incorporating natural or organic ingredients to tap into the increasing consumer demands for high quality and nutritional products.

Figure 2.11: Distribution of Bread Market Share, by retail turnover, 2001



Source: DAFF 2003

2.5.3 Australian Food Safety

During processing of food products from product harvesting to the end product, consumers may be exposed to potential food hazards. These are related to factors including farming methods, food processing techniques, hygiene standards and the availability of information. Food safety issues such as food poisoning, chemical residues and consumption of preservatives have sparked public interest in food safety issues (Miles et al. 2004).

During bread manufacturing, manufacturers need to adhere to various food and health regulations. High levels of food hygiene are maintained to protect the community against health scares associated with food safety. Failure to comply with the food regulations, laws and other rules governing bread production may result in civil remedies, penalties and possible recalls of products.

Bread manufacturing in Australia is regulated by Food Standards Australia New Zealand (FSANZ). FSANZ is the regulatory agency which develops and administers the Australia New Zealand Food Standards code. The code regulates manufacturers to provide information on ingredients used, as well as the nutritional value of the product. Manufacturers are also required to establish the origin of raw ingredients used if they were genetically modified. Specific mandatory warning or advisory labels are required during the labelling of packaged and unpackaged food. FSANZ is also responsible for developing standards and monitors the food supply to ensure it is safe and that consumers are protected (Food Standard Australia New Zealand 2013).

2.5.4 Global Bread Consumption

The global bread and rolls market had a total revenue of \$174.7 billion in 2012. Market consumption of global bread rolls has increased, reaching a total of 87.3 kilogrammes in 2012. In 2012, artisanal bread and rolls accounted for the largest percentage segment of the market (46.4%), followed by industrial bread and rolls market (38.7%), in-store bakery (9.2%) and tortilla (16.31%) (MarketLine 2013). Worldwide bread consumption accounts for one of the largest consumed foodstuffs with over 9 billion kilogrammes of bread produced annually. This is mainly driven

by consumers' demand for convenient fresh products and a source of nutritional value (Heenan et al. 2009).

According to the National Health and Medical Research Council (NHMRC), individuals are encouraged to consume a wide variety of nutritious food each day. The daily intake differs for each age group. Cereals are one of the important foods in our diets which are eaten in large amounts providing both energy and protein. Cereal grains form the foundation of our daily meals with products including wheat, rice, maize, sorghum, oats, rye and barley. In Australia, cereal grains are popular foods such as breakfast cereals, bread, pasta, noodles and rice (NHMRC 2015). According to Australian Bureau of Statistics (ABS 2015), bread was the most commonly-consumed product in the cereals group. Bread was consumed at the median amount of 72 grammes a day.

2.6 Sustainably produced products and Organic

The World Commission and Environment and Development (WCED) established clear linkages between global environmental deterioration, poverty and rapid population growth. The WCED stated that *“Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs”*. Aiking and Boer (2004, 360) defined sustainable development as *“long term balances between ecological, economic and social processes at the level of society as a whole”*. An example of sustainable product purchasing is the purchase of organic food.

2.6.1 Organic product purchasing

Organic farms and food products are required to be certified by appropriate regulatory bodies. Australian Certified Organic is an entity that provides certification programs. The Australian Certified Organic Standard is used in accordance for the business to be certified organic. To ensure the standard meets industry expectations and changes with new practices and research, the standard is reviewed every three years. This standard is applicable to a range of organic businesses including food and

drink, farmers, processors, retailer and manufacturers of certified organic ingredients (Australian Certified Organic 2013).

Over the last decade, consumers are becoming more concerned about the environmental impacts of food production. Food habits and dietary patterns are constantly changing, with consumers becoming more informed on health and nutrition, as well as having increasing concerns about food quality and safety (Tsakiridou, Mattas and Konstadinos 2004). Organic products have a positive image in consumers' point of view as they are considered to be healthier, better tasting, safer to eat, better quality, supports the local economy and are environmentally beneficial compared to traditionally grown products (Hjelmar 2011).

Public concern in food production has eroded with the outbreak of BSE crises, genetically modified organism outbreak, E-Coli outbreak and salmonella scares. This has contributed to the shift towards organic produce due to food safety concerns. This has increased the number of consumers choosing foods with higher quality and safety, such as organic products. Consumers are moving towards convenience and easy-to-prepare meals. This has led to the increasing demand in processed food made with organic ingredients to satisfy their environmental consciousness, quality and health consciousness behaviour (Fotopoulos and Krystallis 2002).

In Australia, organic products have experienced a steady growth of 10% annually. The numbers of certified operators are approaching 3000 in the late 2000s. According to Hartman Group survey conducted in the year 2000, it was revealed that the main determinants of United States consumers to purchase organic products were health, environmental concerns, taste preferences and product availability. Organic certification labelling was one of the primary determinants for decision purchase (Yiannaka 2004). There has been an increased demand for organic products in Australia. The important criteria consumers purchase organic products are for health, taste and environmental benefits. However, there are barriers to organic products as it is viewed as expensive and its low availability (Lea and Lynchehaun 2005). The main barriers preventing consumers from buying organic produce includes the high price, lack of trust and poorly-perceived value (Makatouni 2002).

Organic agriculture is one of the fastest growing industries, with a growing rate of 20% annually totalling US\$7.8 billion in the United States in the year 2000

(Arvanitoyannis and Krystallis 2004). Consumers' willingness to pay extra of a high premium of up to 175% for certain organic products has spurred substantial growth in organic production. Germany was ranked the second largest organic market in the year 2000, with organic product sales of US\$2.5 billion. The demand for the organic product includes fresh fruit and vegetables, dairy products, bread and bakery products and baby foods (Arvanitoyannis and Krystallis 2004). The demand for organic food products is increasing in Asia. Japan and South Korea have been strong markets for organic products. In recent years, Chinese are seeking organic produce due to increasing health and diet relations.

An organic product is perceived as a premium product, and it is expensive due to its perceived quality (Islam 2014). To reflect the perceived difference between organic and non-organic products, there is a price premium on organic products, thus making them expensive. This is primarily due to the higher production costs at each stage of the supply chain (Hill and Lynchehaun 2002). Hill and Lynchehaun (2002) also found that the main reasons consumers purchase organic products is for health reasons, but they also found that consumers also perceive organic products to have better taste and they are better for the environment (Islam 2014). Previous research has indicated that organic purchasing behaviour is affected by environmental and health consciousness, as well as product attributes including freshness, price, taste and nutritional value (Browne et al. 2002). Browne et al (2002) have also identified that there has been an increasing interest in organic fair trade goods, and is moving towards social rights and fair trade standards.

Consumers mainly purchase organic products for health reasons. Previous research has indicated that the willingness to pay more for organic products was characterised by higher income, better education, females, and mainly women with children (Fotopoulos and Krystallis 2002).

Environmental protection is also one of the criteria consumers consider during the purchase of organic produce. Lumbers and Morgan (2004), has shown that consumers purchase organic products due to their perception of health benefits (free from pesticide, are nutritious, are not genetically modified), improved quality and taste, environmental and ethical concerns. Organic products have always been charged at a higher price (Padel and Foster 2005). According to Georges (2004),

there has been the willingness to pay a higher price for return guarantees relating to food safety, health and quality.

According to Banterle, Cereda and Fritz (2013), the price of products with certification is not much higher than the price of products without the certified label. Thus, retailers with certification can improve their image and lead to positive impacts. While comparing organic grain bread with quinoa (\$6.99) and non-organic grain bread with quinoa seeds (\$4.89), the organic product was approximately 30% higher in price. This was consistent with Bodhis online store where organic wholemeal bread costs \$5.40, while non-organic wholemeal bread costs \$4.30 - a difference of 20% in price.

2.7 Factors affecting purchasing decisions

Bread is a perishable product. Perishable is defined if at least one of the conditions takes place: (1) its physical status deteriorates by spoilage, decay or depletion; (2) its value decreases in the perception of consumers; and (3) there is the danger due to the reduced functionality (Amorim, Costa and Almada-Lobo 2014). The appearance of fresh produce such as bread is a critical selling point in which consumers make their decision to purchase on multiple factors. These purchasing selections are mainly dependant on consumer demographics, marketing strategies, environmental awareness, convenience, packaging, amount of product and price (Koutsimanis et al. 2012).

Further, food choices are not necessarily related solely to consumers' physiological needs. Consumers are also focusing on their emotions and ethics including nutrition, taste, enjoyment, anxiety, symbolic and moral meanings. Consumers are increasing their concerns over (1) the attractiveness and acceptability of food products; (2) food and food habits confronted by growing health problems; and (3) accessibility and availability of food products (Dagevos and Van Ophem 2013).

2.7.1 Physical and external attributes of bread

During grocery shopping, consumers are exposed to many different products, each containing quite different information. There are many variables that affect consumers' choice of purchase of food products. The food purchasing decision is complex which can be influenced by several marketing, psychological and sensory factors (Swahn et al. 2012).

Traditionally, consumers focus their purchasing decisions of food products on intrinsic attributes. Intrinsic attributes are related to physical aspects of the product including appearance, freshness, texture and taste. However, these physical attributes alone are not sufficient to meet the requirements of the fast moving markets today, as consumers are becoming more influenced by the extrinsic attributes of product information (Enneking, Neumann and Henneberg 2005). Extrinsic attributes includes brand, place of origin, price, and packaging which influences on customer satisfaction and loyalty (Espejel, Fandos and Flavian 2007).

Sensory marketing has been used by many grocery stores of freshly-baked bread to entice consumers into the stores. In most cases, consumers use colour and the visual appearance of the product to evaluate the quality (Swahn et al 2012). Product value focuses on physical product attributes, price and quality factors. Product value also focuses on the characteristics of food products including nutritional value and sensory characteristics such as taste, freshness, colour, texture and flavour (Dagevos and Van Ophem 2013).

Lusk and Briggeman (2009) also found that taste, price, convenience and product appearance are important determinants of consumer behaviour during product purchase. Over the years, consumers have also incorporated nutritious, safe and healthy food in their purchase decisions, with convenience, prestige and leisure, playing a role in the place of purchase (Macharia, Collins and Sun 2013). According to Zeithaml (1988), packaging is one of the extrinsic attributes consumers make their purchase decision on when intrinsic attributes cannot be evaluated before the purchase of a food product. Due to the important role of packaging, it is constantly being developed and updated to meet changing consumer demands. A number of factors are thought to influence the type of bread that is consumed. Previous studies have shown that bread purchasing is affected by factors including advertising,

texture, recommendations from friends and relatives, and brand loyalty (Nathanael 1956).

2.7.2 Convenience and lifestyle

The key factors why consumers often choose stores by location, include distance from home, convenience and travel time (Zameer and Deepankar 2011). Consumers tend to shop in modern stores due to the wider variety of quality products, lower prices, cleanliness, modern and attractive shopping environment, parking facilities, accessibility and helpful staff (Zameer and Deepankar 2011). The familiarity of the store also plays a positive impact on purchasing behaviour as it creates customer loyalty and commitment to shop in the store (Hino 2014). Location, opening hours, surroundings in which food is purchased, variety of products available, atmosphere and experience are also important factors to consumers to either shop quickly, or convenience shop (Dagevos and Van Ophem 2013).

Consumer lifestyles have changed over the years with dual income and changing food habits (Nwogugu 2004). Working women face time constraints and pressures with household responsibilities and work pressures. The increasing number of women working and long working hours have resulted in little cooking time, thus encouraging the demand for ready-to-eat food products. This changing food habit has increased the demand for processed and packed food and increasing consumption of instant food products due to changes in consumer lifestyle, taste, time constraint and ease of availability (Pradeepa and Kavitha 2013).

Consumer habits are constantly shifting with technological advances and evolving demographics pushing shoppers in new directions (Kervenoael et al. 2006). There has been an increase in online shopping, with the increasing use of mobile phones and internet for shopping. Purchasing products online is a convenient way for consumers to be able to purchase from home during time constraints and busy lifestyles (Kervenoael et al. 2006). Online shopping is also available 24 hours a day, with the added advantage of not having to battle the crowds or find parking spaces (Ahmad, Omar and Ramayah 2010). The transformation of social and economic lifestyles, as well as technology, has also transformed the food industry, changing

lifestyle and attitudes towards foods. There has been an increasing consumption of convenience foods and therefore less dedication to cooking. This is mainly due to the different lifestyles with the increasing social and working activities outside of the home (Casini et al. 2015).

Drive-in retail and fast food have been an increasing trend in Australia, providing consumers with greater convenience to the “consumer on wheels” market. Petrol stations have also been redesigned to provide a wide range of products including fresh food produce, in-store bakeries and an extended range of everyday convenience store items (Hawkins 2004, 57).

2.7.3 Brand

The bread market has become competitive with new products being developed. Brand is an important asset for brand loyalty, brand image and brand awareness. Brand awareness is the ability of consumers to recall a brand of other products in a similar category. Brand loyalty refers to the intention of consumers to buy the brand as the primary choice. Brand image has an effect on perceived brand quality, price and value. Brand gives confidence to consumers, developing a preference during the purchasing decision (Hanaysha and Hilman, 2015).

Ford and Hakanson (2006) considered good quality of relationships with customers as significant assets for brands. Building strong relationships with customers is important as it builds competitive advantages and in turn results in brand success and enhanced performance. A good relationship with customers also increases brand trust, brand commitment and brand satisfaction.

2.7.4 Support local products and accreditation

There has been a growing interest in local product purchasing with the increasing food markets becoming global. According to Miroso and Lawson (2011), local food is referred to “*where food is produced, sold and consumed within a limited geographical area*”. It is also referred to as “locality” and is used to add value to regional food. There have been significant changes in the food systems where the

place of production is becoming increasingly important. There has also been an interest of consumers purchasing locally-grown and produced product to support local farmers and therefore reduce food miles (Zepeda and Li 2006). This includes the addition of value towards local brands and accreditation schemes (Miroso and Lawson 2011). The government is also showing increasing interest in the support and promotion of local foods. Canadians purchase sustainably produced food for health, to support the environment and local farmers (Essoussi and Zahaf 2008). Germans purchase sustainably produced products to support organic farmers, while British consumers purchase produce to support animal welfare (Fotopoulos and Krystallis 2002).

Consumers are also increasing their concerns about food production processes relating to ethics including animal welfare, environmental pollution, chemicals, food miles and fair trade issues that are involved in how food is produced and processed. This has led to the importance and urgency for sustainable food consumption today (Dagevos and Van Ophem 2013).

2.7.5 Health

Over many years, consumers have become more health conscious, with an increasing awareness of nutritional diet, health and food safety issues (Ali, Kapoor and Moorthy 2010). This often leads consumers towards making more healthy food choices. In parallel, consumers are becoming more aware of the composition and origin of their food, and expressing an increasing concern about the environmental impacts of food production (Desmarcheair and Szabo 2008). This is evidenced by the growing demand for sustainably produced food products (Onozaka, Nurse and McFadden 2010).

There has been growing attention and concern around the ingredients and contents of food products. This is mainly due to the increasing interest by consumers to live a healthier lifestyle by paying more attention to ingredients such as fat and additives, as well as their consumption patterns. Consumers may consider a product to be healthy according to specific characteristics relating to health such as vitamins, fat, additives or production method (Sijtsema et al. 2007).

Consumer interest in health has impacted bread consumption with the increasing attempt to consume healthier products due to their increasing health awareness. The increasing awareness of health and nutrition over the past decade was driven by government and private initiatives. These caused consumers to steer away from high carbohydrate diets such as bread. However, there has been an increasing trend towards products such as low fat bakery treat snacks, rice crackers and functional white breads fortified with high fibre and omega 3 (DAFF 2003).

2.7.6 Food safety

There has been increasing concern for health and ethical issues, such as the effectiveness of food systems to provide safe foods and better working conditions for farmers, to protect the biodiversity and to ensure animal welfare (Harper and Makatouni 2002). As income increases, consumers not only demand higher levels of food safety and quality, but also express concerns of environmental sustainability, farmers and animal welfare (Bottonaki et al. 2006). This is mainly evidenced by a number of food scares and crises such as chemical residues, Bovine Spongiform Encephalopathy, salmonella contamination, which is a public problem worldwide shaking consumers' confidence in food quality and safety (Smith and Riethmuller 2000). The main reason for purchasing sustainably produced products is the perception that they contain fewer pesticide and chemical residues (Makatouni 2002).

2.7.7 Environment friendly and sustainable certification

The world market for organic products was valued at US\$ 29 billion in 2005, with the demand for organic product increasing in Europe, USA, Australia and Japan (Dana et al 2009). The main driver for the consumption of organic products is a positive attitude towards environmental concerns and a greater interest in health and nutrition (Vindigni et al. 2001). The main motivation for purchasing organic lies within the individual consumer's values and their concerns for the environment and animal welfare. However, these motivations vary with the type of consumer, as does

the willingness to pay a premium price (Essoussi and Zahaf 2008). Other reasons for purchasing sustainably produced products are “green consumers”, whose lifestyle choice is made by purchasing environmentally friendly products (Fotopoulos and Krystallis 2002). Product attributes such as nutrition, value, taste, freshness and price also play a role in the motivation to purchase organic product (Fotopoulos and Krystallis 2002).

The growing concern for climate and environmental issues has increased the importance of sustainable food labels (Schollenberg 2010). Over the years, consumers are becoming more aware of products marked with environmentally friendly labels (Pahl 2007). Previous studies have also shown a shift in tastes in response to marketing claims which has stimulated an increase in the consumption of products perceived as environmentally friendly (Fotopoulos and Krystallis 2002). In Europe, consumers demand safe and environmentally sustainable food (Seymour 2007).

2.7.7.1 Waste Reduction

An essential part of sustainability includes the perishable food production. It is estimated that 35 percent of average food product is lost during the transportation from production to retail shelf and consumption, meaning that almost one third of food production is lost and wasted. The food products contributing to food waste due to its perishable nature includes fresh bakery products, fresh fruits and vegetables. The main reason for wastage is that the products have passed their expiry date (Kaipia et al. 2011).

With the increasing changes in lifestyle, consumer behaviours are changing requiring an increase in packaging size and new products introduced. Consumers also have different behaviours in food purchasing depending on seasonality and weather, as well as also being affected by promotional activities (Kaipia et al. 2011).

2.7.8 Food labels

Consumers are becoming more aware of food packaging, requiring more information on the product purchased including ingredients, contents, nutritional value and use by date. Food labels on food products contain nutritional information, advising the consumer on their choice. This raises the demands for healthier food products and encourages competition for nutritional quality. Over the years, the increasing concerns for health and nutrition have generated interest in the nutritional labelling of food products (Batlas 2001).

According to Vogel and Vogel (2008), there are a number of attributes that consumers consider during point of sale purchase for bread. The attributes include no preservatives, high in fibre, low GI, yeast free, gluten free and dairy free bread. Social media has also played an important role by advertising brands. Governments are also using media to educate consumers about healthy diet and food safety.

According to Kriflik and Yeatman (2005), food labelling is associated with the food purchase decision which assists consumers with decision-making. Swahn et al (2012) has also supported that food labelling is an important factor in consumer decisions as it provides different types of information and knowledge about the food. This includes information on nutritional health claims, product ingredients, product origin and safety. The two common food date labelling used on bread are the “best before” and “use before” dates. “Best before” date indicates the date after which a product is no longer of its best quality; while “use before” indicates the date after which a product is no longer of sufficient quality and should no longer be consumed (Tsiros and Heilman 2005).

Previous studies have also shown that consumers use country of origin to evaluate products. Country of origin is defined as “country of manufacture or assembly”, and is identified on food labels as “made in” or “manufactured in”. It is also reported that country of origin impacts on consumers’ purchasing decisions for low involvement products. This is mainly due to the country image that affects product image (Ahmed et al. 2004).

2.7.8.1 Carbon Footprint

Labelling carbon footprint on products allows consumers to make decisions during purchasing. With carbon footprint labelling, consumers have the option of choosing products with lower gas emission (Echeverria et al. 2011). Previous studies conducted by Eurobarometer (2009) and LEK Consulting (2008) have shown that consumers have a positive purchasing attitude towards environmentally friendly products. Consumers were reported to be willing to pay a premium for products with a lower carbon footprint.

2.7.9 Quality

Many consumables lose their freshness over time. Thus, in order to ensure food safety and quality, marketers often label freshness dates which indicates their deteriorating freshness over time (Sen and Block 2009). In making the decision to purchase, consumers take into account the freshness of the bread as well as the flavour and texture. Freshness is considered one of the important criteria in choice. Research revealed that 80% of bakery sales were impulse-purchased, induced by perceived freshness (Heenan et al. 2009).

Sensory attributes such as appearance, smell, taste and texture contributes strongly to freshness perceptions. According to Heenan et al (2009), consumers associate bread freshness with a porous appearance, malty odour, sweet, buttery flavour and an oily, moist texture. Darker coloured bread is perceived to be more nutritional compared to lighter coloured bread, while a firmer loaf is thought to be of higher quality (Peterson 1977). Other attributes consumers use when purchasing bread includes the vitamin content, toasting quality, appearance and aroma (Nathanael 1956).

Niva and Makela (2007) show that price, healthiness, convenience and promised health benefits also play a role in product acceptability. According to Chung and Li (2013), consumers' willingness to pay for perishable food decreases as expiry date approaches, with the perception of loss of freshness. Customer satisfaction leads to customer loyalty, thus encourages repeat purchasing of brand (Chung and Li 2013).

2.7.10 Demographics

Grocery shopping is done regularly as a routine, where time and money is spent. Previous literature has shown that gender plays an important factor in time expenditure, and studies have shown that women spend more time shopping compared to men. Although in recent years, there have been demographic changes with the increasing number of women working outside of the home, women continued to be responsible for the majority of household chores, which includes grocery shopping (Anic, Radas and Miller 2011). According to Kumar (2013), children play a significant role in family decision of purchase. This is also dependent on the education, income, profession of parents and whether the parent is single and working or both parents are working.

Cultural diversity is a key feature in Australia, with the increasing immigration transforming Australia's culture and linguistic diversity. At 30 June 2014, the estimated population of Australia's residents born overseas was 6.6 million people, which was a total of 28.1%. Western Australia has the highest rate of overseas born residents with a total of 786,500 people - a total of 33.4% resident were born overseas (ABS 2015). Australia has been promoting multiculturalism as a national identity, where everyone who is ethnically and culturally different is welcomed. This has helped Australia's economy to grow in terms of an increasing intake of international students and skilled migration. This has also improved Australia's standard of living with the growing economic and social contributions of multiculturalism (Ng and Metz 2015).

Studies have shown that age, gender and socio-economic factors play a role in influencing the eating patterns of individuals and that organic purchasers are mainly women (Essoussi and Zahaf 2008). Women are more health conscious compared to men and tend to eat more healthy options (Niva and Makela 2007). Although studies have shown younger individuals are more willing to purchase organic food produce for environmental concerns, organic produce is less affordable (Essoussi and Zahaf 2008). The aging population and higher educated individuals tend to be more health conscious and eat more healthy food. Similarly, families with children are more likely to eat more healthy food according to dietary guidelines (Niva and Makela

2007). Cultural difference plays a role in the purchase of sustainable food, as perceptions and motivations differ with culture.

2.8 Willingness to pay for sustainably produced products

Food production can lead to negative environmental impacts such as high consumption of fuels for packaging and transportation, greenhouse gas emissions, water consumption and waste treatment. These externalities impact on local and global conditions including climate change and loss of biodiversity (McMichael et al. 2007).

European consumers have an increased interest towards environmental and social sustainability of food products, and producers and retailers have paid growing attention in carrying out projects and practices for low environmental impact production. Sustainability will pose as product differentiation in terms of its environmental and social attributes. Sustainability also represents a strategy for enterprise to set a premium price with the need of reliable systems for certification and labelling (Banterle, Cereda and Fritz 2013)

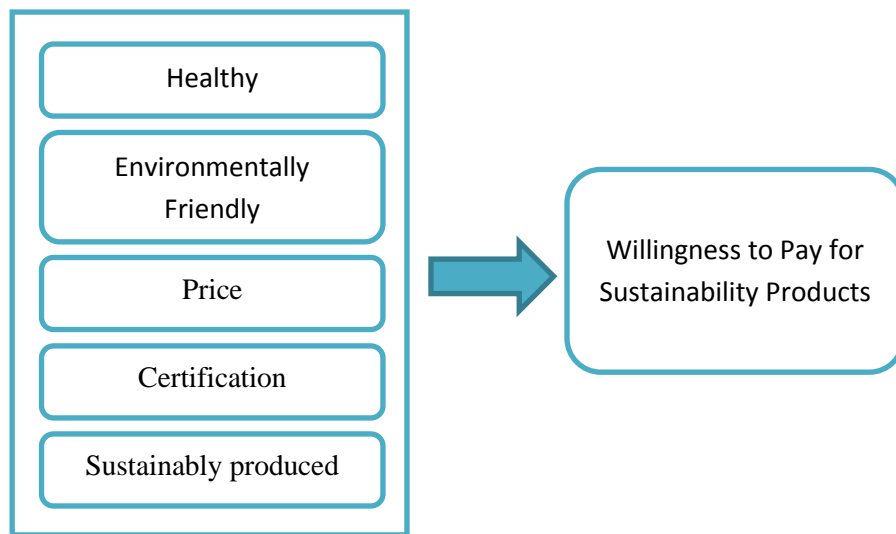
However, while previous research has shown that consumers are willing to pay a premium price for sustainably produced products, the willingness to pay is not always evident (Tangari, Burton and Smith 2015). Although earlier research has indicated positive attitudes and interest in food produced sustainably, the purchase of sustainable products is reported to be low. Having a positive attitude does not necessarily lead to buying the product (Tarkiainen and Sundqvist 2005). More often than not, it is reflected in the consumer's attitudes. Consumers appear to overestimate their preference for environmentally friendly products due to strong social pressure to support the environment (Pahl 2007).

However, with the increasing awareness of climate change and the need to adopt more sustainable farming practices, consumer attitudes may be slowly changing. Therefore, it is important to explore if good environmental practice plays a role in the consumers' purchasing behaviour. In Australia, attention is given to sustainability and the environment, economic and social levels.

2.9 Research Model

This study was designed to investigate the attitude of consumers towards sustainable products. The model of this research, shown in Figure 2.12, was developed to test if factors such as health, food safety, environmentally friendly, cost, certification, sustainably produced, cost and support for farmers have a relationship towards attitude concerning sustainably produced bread.

Figure 2.12: Research Model



2.10 Summary

During the purchase of products, consumers often go through a decision process and are highly dependent on the experience and understanding of the products purchased. Bread is a habitual purchase product as it is being purchased and consumed frequently. Not much time is spent on decision-making. However, consumers highly focus their decision-making in intrinsic and extrinsic attributes, brand, origin, convenience, lifestyle, health, food safety, quality, environment, and certification.

The increasing concerns for health and ethical issues have increased the demand for higher quality and safer foods. There has also been an increased demand for sustainably produced food. The motivation to purchase sustainable products includes the environmentally friendly factor, the higher nutrition value, taste and freshness.

Chapter 3: Methodology

In this chapter, the methodology of the research is structured into six sections: how the research was designed, sampling, data collection, bias and reliability, ethics and data analysis. This research was designed and based in Western Australia, using a questionnaire survey. Data was collected using return mail envelopes. Prior to the sampling and data collection process of questionnaire, ethics approval was required in this study to protect participants. This chapter will discuss these processes and how results and analysis were acquired from the data collected.

3.1 Research Design

This research was designed and conducted in Perth, Western Australia. Respondents were selected within the population of Western Australia residents. This study focused on the theoretical use of consumer behaviour and decision-making process during the purchase of bread. Quantitative research was selected for this research study as it was least expensive, offered more control and was more convenient. Further, quantitative method provides more advantages as it provides a fixed and measurable reality. Data can be easily collected; in this case, this research was done using questionnaire survey method. Quantitative research gathers data in numerical form which can easily be put into categories, ranks or measured in unit of measurement. Through this method, data is easily reported through statistical analysis and can be used to construct graphs and tables. According to Pernice (1996, 339), quantitative research was designed to “*establish causal associations among objectively specified variables through testing hypotheses derived from predictive theories*”. The data collection of samples being used in this study involved questionnaires of a randomly selected sample population within Perth metropolitan residents in Western Australia (Pernice 1996).

This study also used open-ended questions. These open-ended questions encouraged written response from respondents and were aimed to discover underlying motives and desires in human behaviours with the use of in-depth use of questionnaires. Through this, various factors motivating behavioural manners could be analysed (Kothari 2004, 3).

3.1.1 Questionnaire Design

The questionnaire was structured using short and simple sentences to guide respondents by reducing confusion. The questionnaire consisted of closed-ended questions and open-ended questions. Closed-ended questions were where respondents were provided with multiple choice answers or scales from which to choose; while open-ended questions were where respondents provided answers in their own words with more efficient and reliable information (Fink 2003, 35-36).

In order to identify the research objectives of this study, the questionnaire was designed to investigate:

- (1) consumer decision-making in bread purchasing;
- (2) the importance of sustainability and attitudes towards sustainable food products in making the decision to purchase bread from a retail store;
- (3) the consumer's willingness to pay for sustainable products and to support sustainable farming practices.

Questionnaire comprised a composite of several studies. The key writers of the questions were derived from Seymour et al (2007), where consumers demand safe and environmentally sustainable food. Other questions were developed from previous literature pertaining to the purchase of sustainably produced products. Consumers are also increasing their concerns in food production processes relating to ethics including animal welfare, environmental pollution, chemicals, food miles and fair trade issues that are involved in how food is produced and processed (Dagevos and Van Ophem 2013). Consumers are also becoming more health conscious, with an increasing awareness of nutritional diet, health and food safety issues (Ali, Kapoor and Moorthy 2010), where lifestyle choice is made by purchasing environmentally friendly, quality and healthy products (Fotopoulos and Krystallis 2002), purchasing products containing fewer pesticides and chemical residues (Makatouni 2002), high in fibre, low GI, yeast free, gluten free and dairy free bread (Vogel and Vogel 2008). Swahn et al (2012) has also supported that food labelling is important with consumer decision as it provides different types of information and knowledge about the food.

The questionnaire design was developed comprising six sections:

- (1) General information on bread purchasing behaviour
- (2) Bread purchasing attitudes and consumption behaviour
- (3) Perceptions toward bread and sustainability
- (4) Perceptions toward bread labelling
- (5) Demographic variables
- (6) Lifestyle and personality variables

Initial questions focused on the place of purchase, the frequency of purchase, the quantity purchased and the type of bread purchased. In the questions that follow, respondents were then asked to identify the criteria that they used in their decision to purchase bread and the relative importance that they placed upon these attributes. This subsequently led to an exploration of the respondents' understanding of sustainable farming practices and their propensity to pay a premium for bread that has been produced under a sustainable management system. The survey concluded with a number of socio-demographic questions.

Section One included questions to identify if respondents bake any bread in their household, the frequency of fresh bread purchased from retail store, the percentage respondents consume bread and their bread purchasing amount. This encouraged respondents to think back on their past shopping behaviours on bread purchasing habits, including the amount of loaves purchased and the price they paid for the purchase.

Section Two was designed to measure the type and form of bread being purchased and how bread was consumed at home. A likert scale was used to measure the importance of the variables and its importance to bread purchase and health. Open ended-questions were used to explore the factors influencing decision to purchase bread in more depth. The use of open-ended questions was to encourage respondents' thinking process and allow a wide variety of answers (Bradburn, Sudman and Wansink 2004).

Section Three measured the variables and its importance to bread and sustainability. This section also measured the importance of the variables and its meaning to sustainability and their willingness to pay extra for bread produced under a

sustainable manner. An open-ended question was inserted to explore the knowledge respondents have for the term “sustainable farming practices”.

Section Four identified if respondents trust the “made in Australia” label on packaging of bread, the frequency respondents referred to label information and if they found the level of certification adequate. With the assumption that respondents understand and refer to the common labelling information during their purchase, a question on referring to specific labelling question was inserted. A question filter was applied where if respondents were not satisfied, the reason could be provided in the following question. A knowledge question was included to determine the knowledge of respondents towards certified labels used in food products.

Section Five measured the demographic variables including the respondent’s gender, age, origin and locality, household size, occupation and household income.

Section Six included psychographic questions which was used to measure product preferences and behaviour. These questions were used to reflect the respondent’s behaviour and thoughts by generating items relevant to specific behaviour of interest (Bradburn, Sudman and Wansink 2004). This section measures the types of food respondents consumed at home and the major consumer of bread in the household.

3.1.2 Sample

Sampling was a crucial part of the research process. This study was aimed to understand the attitude and perception of consumers toward sustainable bread purchase. First, we identified who our targeted groups were to be involved in the research process. The respondents targeted were responsible for bread purchase in their household, or were those who consume bread at home, were above the age of 18 and live in Australia.

Simple random sampling was selected using systematic convenience sampling whereby respondents were selected based on every third customer who entered the store. This sampling method was used with the statistical population having the same equal probability of being chosen to ensure a degree of representativeness (Denscombe 2003, 12). Data collection was conducted on different days of the week

and at different times to ensure a random and representative sample was obtained. Data collection was also done on weekends to target weekday working respondents.

Although the sample survey collected had to be representative of the population, it also had to be a certain number to be of adequate size. This was to maintain a balance between proportions within the sample and the proportions that occur in the overall population to be representative (Denscombe 2003, 21). In this study, the sample size of respondents was aimed at 500 respondents to be relative to Western Australian population. During data collection, 800 questionnaires were being handed out, achieving a response rate of 392 responses.

3.1.3 Data collection

Data collection was targeted where consumers purchased the product. Independent Grocers of Australia (IGA) around the Perth metropolitan area were selected as the main data collection point. This is because IGA is one of the major grocery chains within Western Australia, and also because data collection was not permitted in the major shopping malls in which both Coles and Woolworths are located.

Prior to data collection, store managers were approached to receive approval to conduct research at the store. Once approved, data collection was conducted at the entrance of the store; when rejected, another IGA store was selected. Respondents were then recruited outside IGA stores. Respondents were selected by intercepting every third person who entered the shop. Respondents were approached in front of the store and asked if they were willing to help complete the 20 minute survey. When the customer refused, the next customer who entered the store was then approached.

Customers who were willing to help with the survey were then asked two qualifying questions to screen and identify their suitability: (1) the respondent must be involved in the decision to purchase bread; and (2) they must have purchased bread for home consumption within the last three months. In order to overcome the low response rate associated with completion of the questionnaire at the store, once the respondent was qualified, they were offered the choice to either complete the survey on the spot or complete the survey at home and return the survey in a reply-paid envelope.

Data collection of personally handing out questionnaires was initially selected due to the direct contact between the researcher and respondent. The first 20 questionnaires were done on the spot outside the store as a pilot study. During the pilot study, face to face interviews were conducted prior to the use of reply paid envelopes. This is to test the understanding and ease of questionnaire response from respondents. After the pilot study, reply paid envelopes given out with questionnaires during data collection, however, respondents also have the option to conduct the survey on the spot.

Respondents completed the 20 minute questionnaire willingly, following an explanation of why the research was being undertaken. The respondents were more engaged, leading respondents to complete more items, make fewer mistakes and provide more answers to open-ended questions (Brown, Culkin and Fletcher 2001).

3.1.4 Validity, Reliability and Bias

Validity, reliability and bias were concepts that were required in both quantitative and qualitative research. Validity is defined as “*whether the measurements measure what they are supposed or claimed to measure*” (Rosnow and Rosenthal 2002, 139). Validity consists of three forms which include content validity, predictive validity and construct validity. Content validity is whether “*the items measure the content they were intended to measure*”; predictive validity is whether “*scores predict a criterion measure or does the results correlate with other results*”; and construct validity is whether “*items measure hypothetical construct or concepts*” (Creswell 2009, 149). A pilot test was conducted to test the validity of questionnaire design. The pilot test was done by selecting 20 respondents, and questionnaires were handed out to detect any difficulties and if respondents answered questions in the manner intended (Rosnow and Rosenthal 2002, 115).

Reliability is the consistency and stability of results. Cronbach alpha was used on scales and is a measure of internal consistency (Rosnow and Rosenthal 2002, 139). The major contents included in the survey instrument include ethic approval, cover letter, items measuring demographics, attitudinal and behavioural items. The questionnaire included categorical scales such as yes or no, male or female or

ranking; and continuous scales of strongly agree to strongly disagree (Creswell 2009, 150). All scales used in this study have been used in prior studies. The use of 4 point likert scales was selected to force respondents to give a response to questions. However, a 6 point likert scale was used in “agree/disagree” scales. According to Lozano et al (2008, 73), *“the optimum number of alternatives is between four and seven. With fewer than four alternatives the reliability and validity decrease, and from seven alternatives onwards psychometric properties of the scale scarcely increase further.”* Regression is a statistical measure that attempts to determine the strength of the relationship between a dependent variable and an independent variable.

Bias in research occurs in quantitative research. Bias is an error that occurs during the design, measurement or sampling of the research. The types of bias in research are selection bias and information bias. Selection bias is where the sample is not representative of the population; while information bias occurs through the data collection process (Bradburn, Sudman and Wansink 2004). In order to eliminate selection bias, respondents were selected on the basis of every third customer who entered the IGA store. This allowed the sample to be representative for the population by randomising, but also having a sequence in sample selection. Information bias was reduced by structuring questionnaires in simple and short sentences to reduce non-response bias.

3.1.5 Ethics

This project was approved by the Curtin University Ethics Committee (Approval No. SOM-21-2012). Prior to research being conducted, an application for approval of research with low risk (Form C) was submitted to the Human Research Ethics Committee. Form C approval was required for *“research that involves low or negligible risk where participants have the potential to suffer no harm, but where there is potential to suffer only inconvenience or discomfort”* (Curtin University, 2015).

Participation for this research was voluntary and respondents were non-identifiable. Participants were given an information sheet indicating the aims of research,

voluntary participation and confidentiality of information collection. Participation for this research was verbal (when respondents answered the questions asked by the researcher on the spot) and written (when respondents were interested in participating in this research, but did not have time to answer on the spot). In the latter case respondents were invited to complete the questionnaire at their own time and send the completed questionnaire in a reply-paid envelope to the researcher's school. All the information collected was kept in the strictest confidence and used for research purposes only. Only the researcher and the supervisor had access to the raw data.

3.2 Data Analysis

After data collection, results were coded and entered into Statistical Package for the Social Sciences (SPSS) for analysis. Coded results were cleaned for missing values and errors (Denscombe 2003, 184). Analyses that were performed include univariate descriptive, multivariate descriptive, factor analysis and analysis of variance.

Data was analysed using SPSS 17.0. A variety of descriptive statistics was used for both nominal and ordinal variables to record frequencies and percentages. For metric data, measures of centrality (mean, mode and median), dispersion (standard deviation) and distribution were employed to test for normality. Cross tabulations was utilised to explore relationships between categorical variables, with the t-test and ANOVA used to identify significant differences between variables where at least one variable is metric. Exploratory factor analysis and cluster analysis was used as appropriate to group variables and or respondents.

3.2.1 Univariate descriptive

Univariate descriptive calculate statistics, such as frequencies and percentages. Frequency reports the amount of scores in each category and how the distribution looks. Frequency also provides relevant information of valid cases for each variable. From the frequency column, data entry errors can be identified (Szafran 2012, 78). However, data entry errors that can be identified are limited. For example, if data

entry is “1 being male” and “2 being female”, only data entry outside of 1 and 2 can be identified. However, for errors of mistyping 1 for “female” or 2 for “male”, the error cannot be identified because both codes 1 and 2 are legitimate codes (Pallant 2011, 44).

3.2.2 Multivariate descriptive

Mean and standard deviation are descriptive analysis. Multivariate analysis measures the difference in average of groups. Multivariate analysis is used for continuous variables such as percentages, numbers and scales. To minimise the large amount of single values involved, the descriptive stats provide a summary of mean, median and standard deviation (Pallant 2011, 56).

3.2.3 Factor Analysis

Factor analysis is a data reduction technique. A large set of variables is reduced into a smaller set of factors or components. The first step is calculating the Pearson correlation coefficient for each pair of variables. In order for the factor analysis to make sense, the correlation should be greater than 0.3.

Factor analysis is only significant if the variables are sufficiently associated to one another. Bartlett’s test of sphericity and Kaiser-Meyer-Olkin (KMO) provides insight into the degree of correlation. KMO is the measure of sampling adequacy statistic, and usually lies between 0 and 1. However, factor analysis is not suitable if the value is less than 0.5. Bartlett’s test gives the statistical probability that shows if variables are meaningful for factor analysis.

Exploratory factor analysis (EFA) is a statistical technique used to reduce a relatively large set of variables into smaller variables. It is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables (Denscombe 2003).

Eigen values are the variances of factors. The variables are standardized after conducting factor analysis with each variable having a variance greater than 1.

Varimax rotation maximises the variance of the factors, thus the total amount of variance accounted for is distributed over the extracted factors. Suppress value is an option useful for assisting in interpretation. During the data analysis, a suppress value of ≤ 0.4 was used.

3.2.4 Reliability

Reliability analysis for Cronbach Alpha is conducted. Although Cronbach alpha is acceptable if it is above 0.6, the higher the value of Cronbach alpha, the results are considered better (Janssens et al. 2008, 255).

The next chapter will discuss the results of data collected from the research. Data collected is coded and cleaned of missing values and errors. A series of analysis is conducted using SPSS to achieve results and is further discussed in the chapter.

Chapter 4: Results

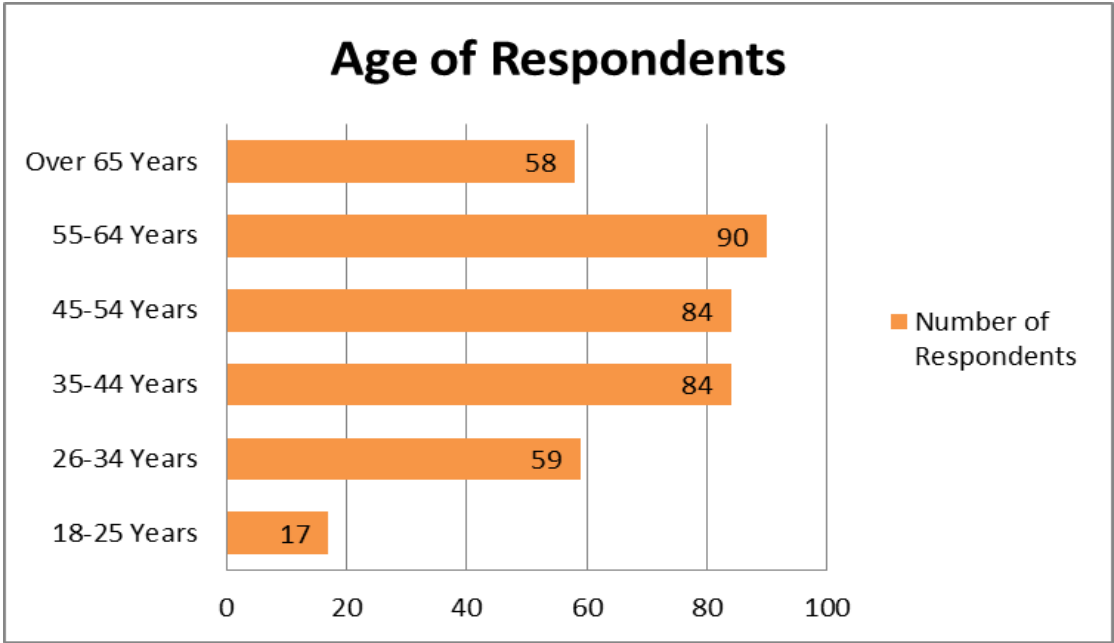
In this study, 800 questionnaires were distributed with reply-paid envelopes, and a total of 392 respondents (49%) participated in this study. During the beginning of the data collection, when reply-paid envelopes were not used, there was a low rate of response as respondents were not prepared to complete questionnaires on the spot due to time constraints. However, respondents were more prepared to complete the questionnaire at home, and return the questionnaires using the reply-paid envelope provided. The high response rate of 49% was from respondents who were willing to help complete the 20 minute questionnaire at home during their own time and the completed questionnaire was posted back using the reply-paid envelope.

This chapter consists of results collected from returned questionnaires from respondents. The completed 392 questionnaires were coded into SPSS and were “cleaned” for missing values and errors. The results were obtained by analysing descriptive statistics, mean and standard deviation, and factor analysis as well as regression.

4.1 Demographics

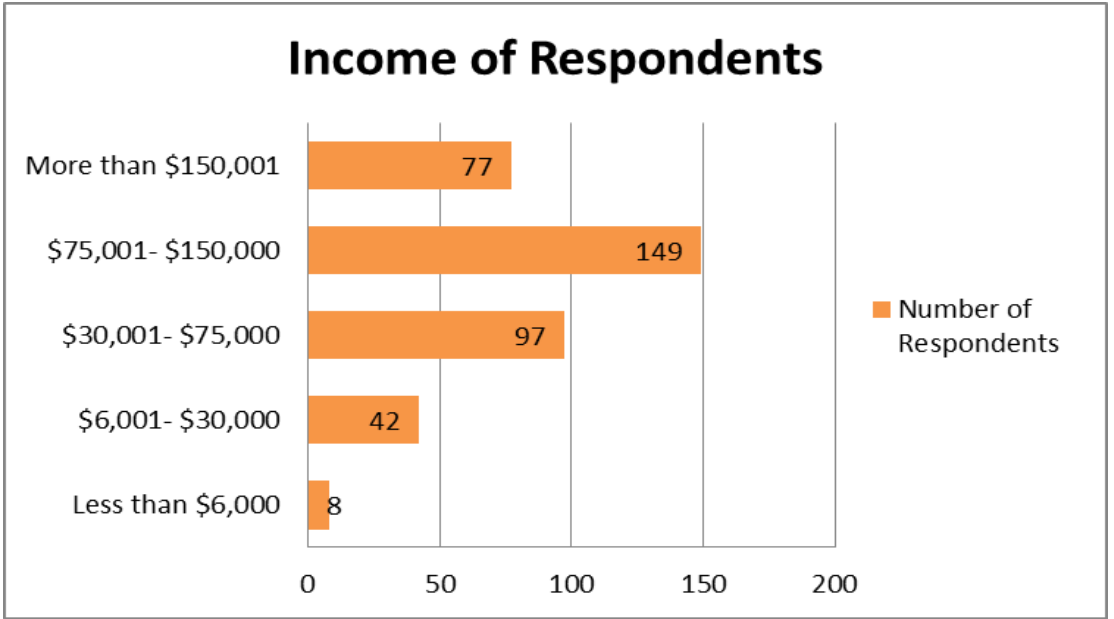
The majority of respondents were female (68%), while male respondents comprised 32% of participation in this study. The majority of respondents (66%) were aged between 35-64 years. A similar proportion of respondents were aged between 26-34 years and over 65 years accounted for 30% of the respondents. A small proportion of respondents (4%) were aged between 18-25 years (Figure 4.1).

Figure 4.1: Age



Out of 373 responses, the majority of respondents (87%) had a combined household income between AU\$ 30,001 – AU\$ 150,000 per annum. Only 13% of the household income had a combined income less than AU\$ 30,000 per annum (Figure 4.2). There was a wide spread of occupations collected during the research (Appendix 2.2)

Figure 4.2: Income



Most of the respondents were born in Australia (53%), while the remaining respondents (47%) were born overseas or had family members who were born overseas. There was a good mix of ethnicity who participated in this study. Countries range from Europe, Asia, Africa and more countries all over the world (Appendix 2.3).

The majority of respondents often consume western cuisine (3.41) in their household. Asian cuisine (2.58) was also consumed, on occasion (Table 4.1).

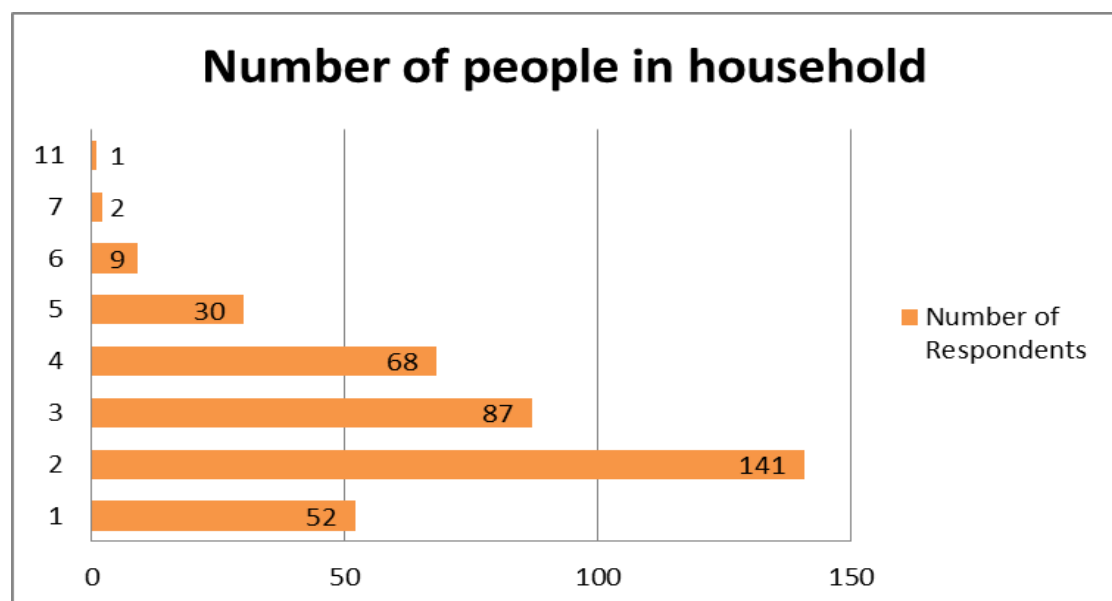
Table 4.1: Type of meal eaten

Type of meal eaten	Mean	Standard Deviation
Western cuisine	3.41	0.66
Asian cuisine	2.58	0.78
Middle East cuisine	1.85	0.78

Where 1 is “not at all”; 2 is “not often”; 3 is “sometimes”; 4 is “regularly”

The majority of respondents (71%) did not have children below the age of 18. Most respondents have 2 to 3 people (58%) in their household. A similar proportion of respondents were living alone (13%) and four people (17%) in their household (Figure 4.3).

Figure 4.3: Number of people in household



4.2 Bread purchase and consumption

The majority of respondents did not bake bread at home (79%), while the remaining 21% of respondents did bake bread at home (Figure 4.4). Retail outlets were the primary place of purchase of bread (87%) (Table 4.2).

Figure 4.4: Does respondent bake bread at home?

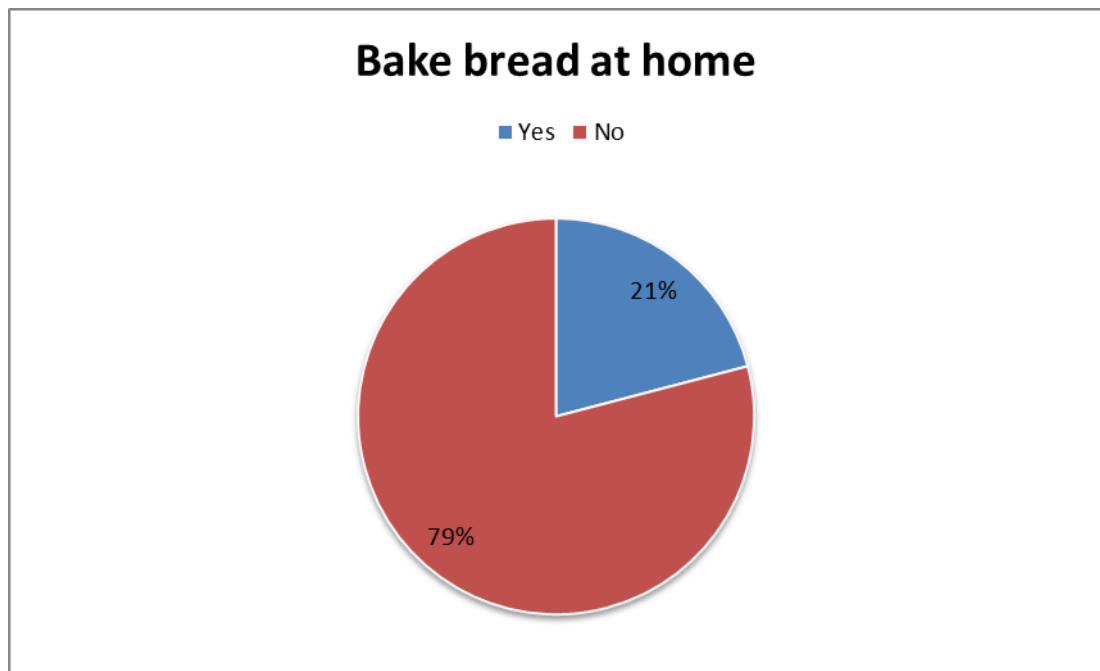


Table 4.2: Source of bread

Source of bread	Mean	Standard Deviation
Purchase from a retail outlet	87.29	25.50
Bake yourself from ingredients	3.88	13.56
Consume as takeaway	3.13	9.62
Obtain from other sources	1.24	7.82
Obtain as a gift from friends and family	1.18	8.08
Bake yourself from frozen dough	0.32	4.82

Most of the bread purchased was from Coles, Woolworths and IGA (60%) (Table 4.3). There was also a proportion of respondents who purchased their bread from retail bakery stores. It is not our objective to determine market share in this study, but rather to determine the place of purchase. Coles and Woolworths are so called 'one stop shops' and are generally located in central locations in large shopping

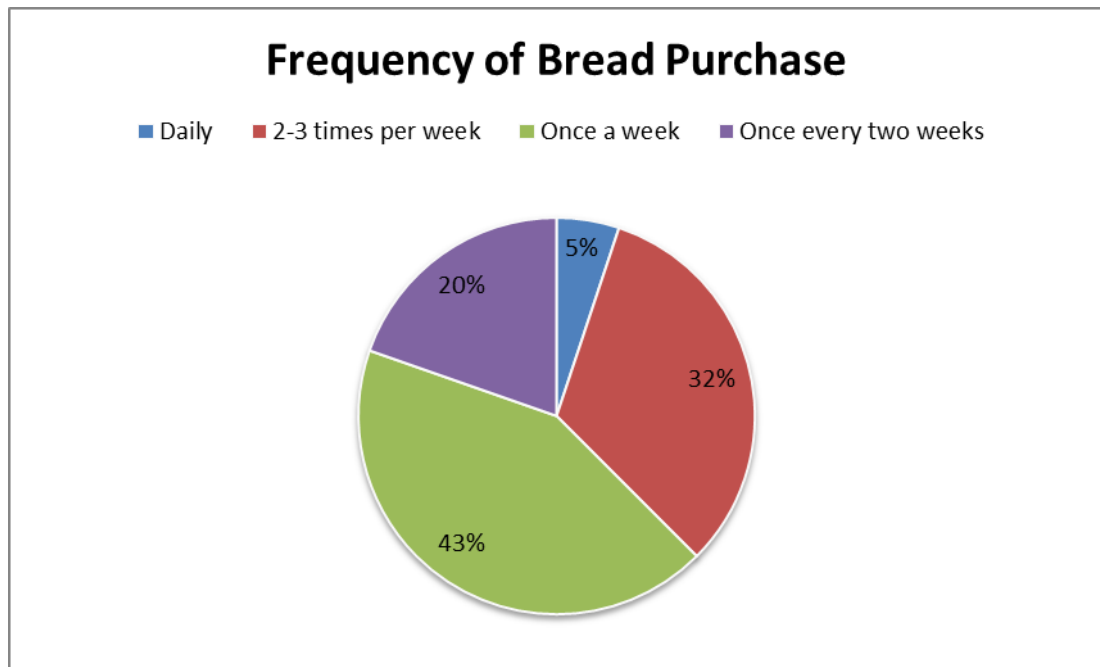
malls. IGA stores, on the other hand, are generally located in suburbs where it operates as an independent store, thus it serves as an entirely different segment of the market relating to convenience shopping patterns (Batt 2015).

Table 4.3: Place of purchase

Place of purchase	Mean	Standard Deviation
Coles and Woolworths	37.92	33.64
Independent supermarkets (IGA)	33.40	33.85
Retail bakery shop	18.09	28.02
Growers markets/fresh produce markets	3.51	12.68
Gourmet food shop/health shop	2.20	9.08
Convenience stores or deli	1.28	4.94
Internet	0.41	5.29
Petrol stations	0.21	1.38

Most respondents (75%) purchased bread at least once a week, while 20% of the respondents purchased their bread once every two weeks. A small percentage of respondents (5%) purchased fresh bread on a daily basis (Figure 4.5).

Figure 4.5: Frequency of purchase



The majority of respondents purchased sliced bread for household consumption (88%). Majority of respondents freeze their bread (74%). The quantity of loaves purchased on each occasion was between one to two loaves (standard deviation = 0.73). The price for each loaf purchased costs \$3.60 on average (standard deviation = 1.33).

Respondents identified that bread is being consumed regularly in their home themselves (3.46). Respondent's spouse (3.50) and kids (3.54) consumed bread on a regular basis (Table 4.4).

Table 4.4: Major consumers of bread at home

	Mean	Standard Deviation
Myself	3.46	0.78
Spouse	3.50	0.79
Kids	3.54	0.84
Parents	2.78	1.23

Where 1 is "not at all"; 2 is "not often"; 3 is "sometimes"; 4 is "regularly"

The most frequently purchased bread types were mixed or multigrain (2.76) and wholemeal (2.55). White bread still remains one of the top breads being purchased (2.20). There is a small group purchasing a new variety of mixed with chia, soy or linseed (1.99) (Table 4.5).

Table 4.5: Type of bread purchase

Type of bread purchase	Mean	Standard Deviation
Mixed or multigrain	2.76	1.22
Wholemeal	2.55	1.23
White	2.20	1.24
Mixed with chia/soy/linseed	1.99	1.18
Flat or pita	1.76	0.94
Sour dough	1.68	0.96
Rye/spelt	1.64	1.00
Fibre enhanced white	1.63	1.01
Gluten Free	1.28	0.73
Lupin	1.07	0.34

Where 1 is "not at all"; 2 is "not often"; 3 is "sometimes"; 4 is "regularly"

The majority of respondents purchase bread loaves (3.22) and bread rolls (2.27). A small proportion of respondents also purchase wraps (1.89), fruit loaf (1.84), garlic bread (1.76) and Turkish bread (1.74) (Table 4.6).

Table 4.6: Form of bread purchase

Form of bread purchase	Mean	Standard Deviation
Loaf	3.22	1.14
Bread rolls (round)	2.27	1.02
Wraps	1.89	1.03
Fruit loaf	1.84	0.95
Garlic bread	1.76	0.90
Turkish Bread	1.74	0.85
Roll (assorted) bread	1.64	0.86
Pita	1.61	0.85
Crusty Vienna	1.61	0.83
Dinner rolls	1.60	0.82
Bread sticks	1.57	0.78
Naan bread	1.38	0.69
Savoury bread	1.34	0.62
Pull apart pack roll	1.28	0.58
Sweet bread	1.22	0.54
Chapatti	1.22	0.56

Where 1 is “not at all”; 2 is “not often”; 3 is “sometimes”; 4 is “regularly”

The most common form of bread consumption was toast (3.60) and sandwiches (3.41). A small group of respondents consumed bread with soups (2.29) and as a snack (1.95) (Table 4.7).

Table 4.7: How bread is consumed

How bread is consumed	Mean	Standard Deviation
Toast bread	3.60	0.68
Sandwiches	3.41	0.88
With soups	2.29	1.04
As a snack	1.95	1.02
Stuffing for roast meats	1.21	0.56
As a pudding	1.14	0.41

Where 1 is “not at all”; 2 is “not often”; 3 is “sometimes”; 4 is “regularly”

4.3 Factors influencing bread purchase

In indicating the criteria respondents most often use - freshness (22%) and health factors (19%). Price (16%), Preference (15%) and type of bread (13%) were also important factors respondents listed during the purchase of bread (Table 4.8).

Table 4.8: Factors influencing choice

Reason	Reason 1	Reason 2	Reason 3	Reason 4	Reason 5	Total	Percentage (%)
Freshness	97	71	43	15	7	233	21.9
Health	77	69	37	14	9	206	19.4
Price	75	40	35	14	10	174	16.4
Preference	43	50	30	26	10	159	15.0
Type of bread	43	53	30	12	2	140	13.2
Brand	35	30	18	9	7	99	9.3
Origin	6	5	5	8	2	26	2.4
Location	8	7	5	3	2	25	2.4
Total Responses	384	325	203	101	49	1062	100

However, when respondents were asked to rate the importance of the attributes most often used in their decision to purchase bread from a retail store, freshness (5.50) and taste/flavour (5.22) were ranked the most important variable. Nutritional value (4.84), texture (4.79) sliced/unsliced (4.66) and the type of grain (4.53) was of moderate importance (Table 4.9).

Table 4.9: Importance of variables in decision-making

Importance of variables in decision-making	Mean	Standard Deviation
Freshness	5.50	1.01
Taste/flavour	5.22	1.26
Nutritional value	4.84	1.46
Texture	4.79	1.47
Sliced/unsliced	4.66	1.59
Type of grain	4.53	1.62
Buy what the family likes to eat	4.40	1.89
Softness	4.39	1.66
Value for money	4.29	1.66

Baked in Western Australia	4.25	1.90
Competitive price	4.09	1.75
Shelf life/storage life	3.93	1.80
Size or weight of the loaf	3.55	1.75
Produced in a sustainable manner	3.47	1.84
Brand or label	3.46	1.82
Price discounts/specials	3.45	1.89
Produced under a Fairtrade label	3.04	1.81
Organic	2.64	1.63
Product information in-store	2.14	1.45
In-store tastings/demonstrations	1.79	1.22
Advice from sales assistants	1.73	1.13
Advertising on radio/tv/newspapers	1.65	1.08
Website information	1.43	0.99

Where 1 is “not important at all”; 6 is “very important”

When respondents were asked to rate their thoughts on the health aspects of bread, healthy – good for me (4.97) was ranked the most important variable. Nutritional value (4.62), safe to eat (4.34), high added fibre (4.22), free from artificial preservatives (4.20), and free from chemical residues (4.04) were of moderate importance (Table 4.10).

Table 4.10: Health and bread purchase

Health and bread purchase	Mean	Standard Deviation
Healthy – good for me	4.97	1.37
Nutritional value	4.62	1.54
Safe to eat	4.34	1.84
High/added fibre	4.22	1.66
Free from artificial preservatives	4.20	1.84
Free from chemical residues	4.04	1.89
Free from flavour enhancing compounds	3.98	1.88
Low fat	3.68	1.83
Low GI	3.66	1.80
Low salt	3.58	1.84
Food energy content – kilojoules/calories	3.46	1.75
Added vitamins and minerals	3.29	1.72
May contain genetically modified	3.27	1.90
Potential presence of allergens	3.08	1.89
Gluten free	2.41	1.68

When respondents were asked to rate their thoughts on the environment and community aspects of how bread was being produced, local (WA) product (4.24) was ranked the most important variable. Country of origin (3.85) was of moderate importance (Table 4.11).

Table 4.11: Environment and community and bread purchasing

	Mean	Standard Deviation
Local (WA) product	4.24	1.91
Country of origin	3.85	2.05
Recyclable packaging	2.90	1.75
Organic	2.57	1.62
Fairtrade	2.55	1.74
Worker welfare	2.38	1.72
Food miles	2.21	1.61
Waste management	2.17	1.60
Water use and pollution	2.18	1.60
Carbon footprint	2.09	1.47
Greenhouse gas emissions	2.01	1.43
Protecting indigenous culture and land rights	1.98	1.48
Salinity and land degradation	1.95	1.42
Meets halal or kosher requirements	1.45	1.09

Where 1 is “not important at all”; 6 is “very important”

4.4 Food label and bread purchase

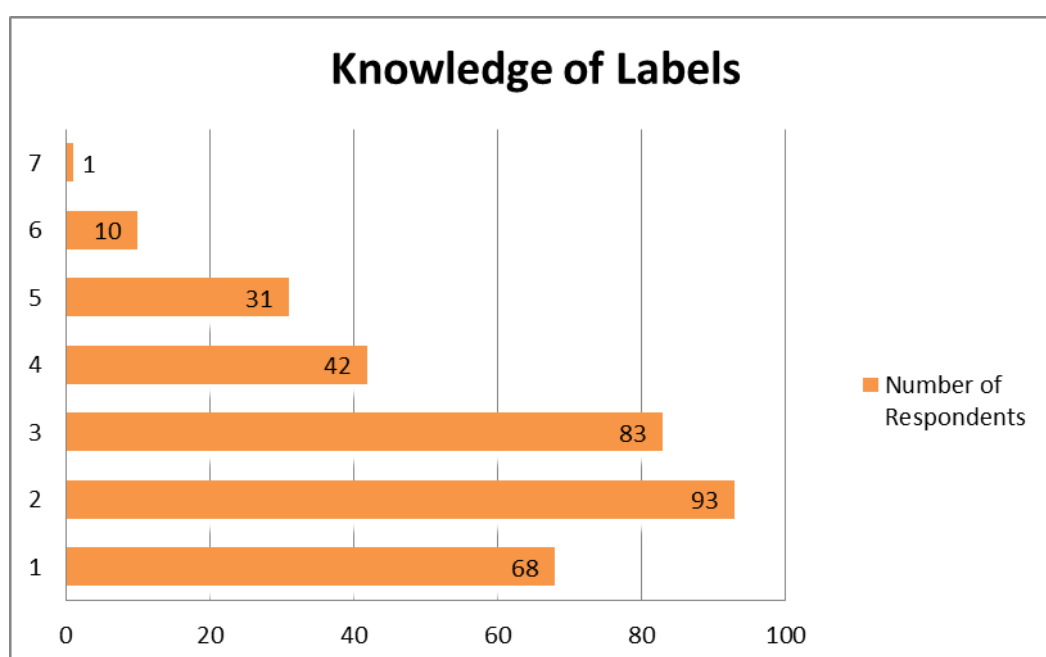
The majority of respondents trusted the ‘made in Australia’ label on bread products (80%), while the remaining 20% respondents did not trust the ‘made in Australia’ label. When respondents were asked about the recognition of quality assurance, the most identifiable labels were Fairtrade (62%) and Australian Certified Organic (61%) (Table 4.12).

Table 4.12: Recognition of quality assurance

	Yes		No	
	Frequency	Percentage (%)	Frequency	Percentage (%)
	240	61.7	149	38.3
	237	61.1	151	38.9
	123	31.8	264	68.2
	116	29.8	273	70.2
	106	27.2	283	72.8
	56	14.4	332	85.6
	16	4.1	372	95.9
	13	3.4	374	96.6
	8	2.1	375	97.9

Majority of the respondents (64%) could only identify three or less quality assurance labels. This showed that more knowledge on labels is required (Figure 4.6).

Figure 4.6: Sum of certification labels



A large number of respondents did not find the level of certification adequate on bread (52%). The main reason for respondents not being satisfied with the level of certification was the lack of education and recognition (43%) of labels. Logos not being clear or too small (18%) was another reason causing dissatisfaction in labelling (Table 4.13)

Table 4.13: Reason for inadequate level of certification

	Reason 1	Reason 2	Reason 3	Total	Percentage (%)
No education/recognition	82	18	1	101	43.7
Symbols not clear	35	6	1	42	18.2
No interest/Not sure	31	2	0	33	14.3
Standardised Accreditation	18	5	1	24	10.4
Marketing tool	15	6	1	22	9.5
Labelling	5	4	0	9	3.9
Total Responses	186	41	4	231	100

The majority of respondents referred to label information during their purchase (81%). The majority of respondents look for 'use-by-date or best-before-date' during purchase of bread (92%). A large number of respondents look at the amount of sugar

(76%), where the product was made (73%), the amount of fat (73%), food additives (70%), and the amount of salt (64%) (Table 4.14).

Table 4.14: Information of food labels

	Yes		No	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Use-by-date or best-before-date	282	91.6	26	8.4
The amount of sugar	236	76.4	73	23.6
Where the product was made	226	72.9	84	27.1
The amount of fat	225	72.6	85	27.4
Food additives (artificial colours and/or preservatives)	216	70.1	92	29.9
The amount of salt (sodium)	198	64.1	111	35.9
Calories (kilojoules)	161	52.3	147	47.7
Where the ingredients were sourced from	157	50.8	152	49.2
Any added vitamins/minerals/fibre	155	50.0	155	50.0
Heart Foundation endorsement	143	46.3	166	53.7
Glycaemic index (GI)	138	44.8	170	55.2
Product is GM/non GM	127	41.0	183	59.0
Product is organic	114	37.0	194	63.0
Quality assurance label	107	34.7	201	65.3
Some assurance that the food was produced in a sustainable manner	96	31.3	211	68.74
Gluten free	82	26.5	228	73.5
A halal or kosher food label	26	8.5	281	91.5

4.5 Sustainability and bread purchase

The majority of respondents understood the meaning of sustainability being good for the environment (72%). There was a small percentage of respondents who understood sustainability as ‘good for the community’ (8%), and health (7%) (Table 4.15).

Table 4.15: Meaning of ‘Sustainable Farming Practices’

	Reason 1	Reason 2	Reason 3	Reason 4	Reason 5	Total	Percentage (%)
Good for environment	243	166	88	39	11	547	72.5
Good for community	20	20	10	8	4	62	8.2
Nothing	53	3	1	1	1	59	7.8
Health	19	13	12	3	5	52	6.9
Price Concerns	8	2	1	2	0	13	1.7
Support Local Product	6	0	3	0	2	11	1.5
Interest in food standard and safety	5	2	1	3	0	11	1.5
Total Responses	354	206	116	56	23	755	100

When respondents were asked their thoughts about sustainable farming practices, most respondents strongly agree that sustainable farming statements include ‘support soil and water conservation’ (5.40), ‘encourage the more efficient use of resources’ (5.38), ‘minimise the use of chemical inputs’ (5.28) and ‘minimise the use of chemical inputs’ (5.27) (Table 4.16).

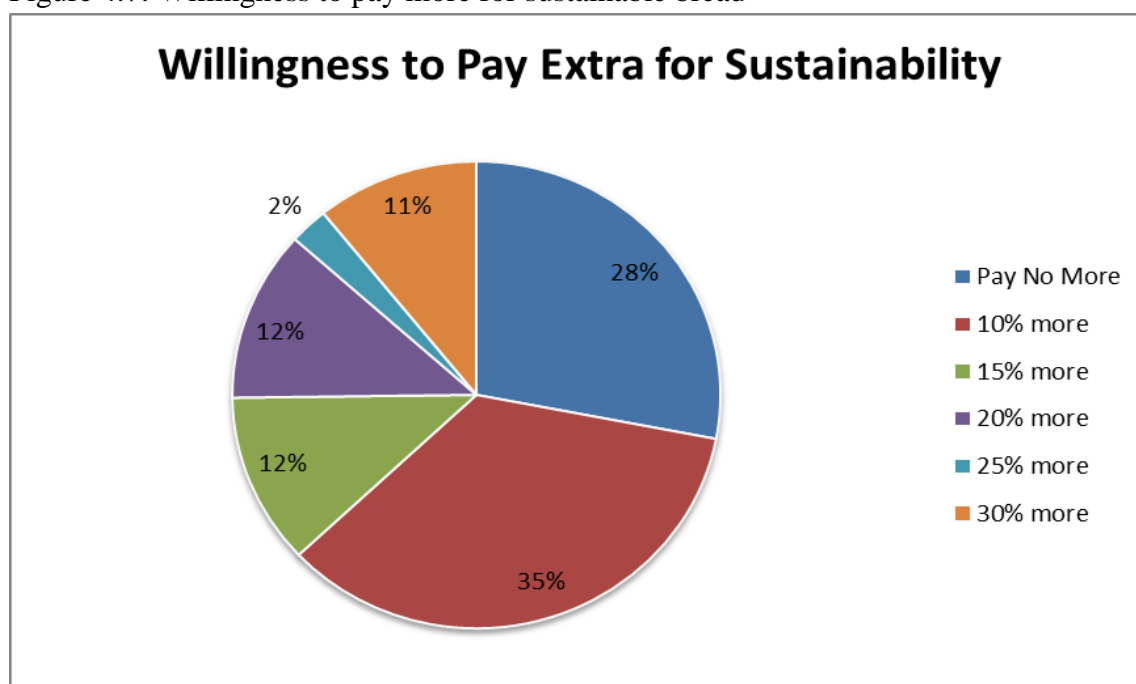
Table 4.16: Sustainable farming practices

Sustainable farming practices	Mean	Standard Deviation
support soil and water conservation	5.40	0.99
encourage the more efficient use of resources	5.38	0.99
minimise environmental degradation	5.28	1.06
minimise the use of chemical inputs	5.27	1.12
support ecologically sound development	5.12	1.11
provide sufficient nutritional value	5.11	1.17
support rural communities	5.07	1.23
encourage the use of organic manures	5.02	1.27
minimise the production of greenhouse gases	4.88	1.35
provide adequate economic and social rewards for those involved in food production	4.84	1.32
enhance the quality of life for farmers	4.81	1.34
will increase the price of food	4.04	1.53
reduce productivity per unit area	3.66	1.58

Where 1 is “I disagree a lot”; 6 is “I agree a lot”

The majority of respondents were willing to pay more for sustainable bread. The majority of the respondents (58%) were willing to pay a premium of 10-20% for bread produced under a sustainable manner. Respondents were willing to pay a premium of \$0.45 to \$0.90 per loaf of bread. There was a group of respondents (28%) who are not prepared to pay extra for sustainable produced bread. There was also a small group (14%) who are willing to pay above 20% for sustainable bread (Figure 4.7).

Figure 4.7: Willingness to pay more for sustainable bread



The majority of the respondents were also willing to pay a premium for other food products produced under a sustainable manner (Table 4.17). The willingness to pay more for other food products were firstly milk (91%), followed by chicken meat (90%), eggs (89%), beef (84%), breakfast cereals (76%), and crackers (75%). This was relevant in the study to measure the willingness to pay for other frequently purchased products. The willingness to pay more for other products was relevant in this study. This supports that consumers were not only willing to pay for bread products, but were also willing to pay a premium for other products consumed frequently.

Table 4.17: Willingness to pay more for other products

	Yes		No	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Milk (per litre)	241	91.3	23	8.7
Chicken meat (per kg)	231	90.2	25	9.8
Eggs (one dozen)	234	89.3	28	10.7
Beef (per kg)	205	84.4	38	15.6
Breakfast cereals (per box)	168	75.7	54	24.3
Crackers/plain biscuits	181	74.8	61	25.2
Beer (per carton)	93	58.9	65	41.1

4.6 Other consideration factors of bread consumption

The majority of respondents who had diet requirements were mainly on a casual diet to lose weight (38%). Other diet requirements were for medical reasons (11%), allergens (10%) and vegetarian diets (9%) (Table 4.18).

Table 4.18: Diet

Diet	Yes		No	
	Frequency	Percentage (%)	Frequency	Percentage (%)
On a casual diet to lose weight	146	37.5	243	62.5
On a special diet for medical reasons	43	11.0	347	89.0
On a special diet due to allergies	39	10.0	350	90.0
Mainly vegetarian (eat fish but not meat)	36	9.2	354	90.8
Lacto vegetarian (eat eggs and dairy products)	25	6.4	365	93.6
Following a strict plan to lose weight	25	6.4	364	93.6
Completely vegetarian	12	3.1	378	96.9
On a special diet for religious reasons	7	1.8	382	98.2
Vegan (do not eat products derived from animals)	4	1.0	386	99.0

When respondents were asked their interest of statements, most strongly agree with the statements 'healthy eating reduces the risk of disease' (5.55). Most of the

respondents also agree to the statements ‘I support local WA business’ (5.09) and ‘I am concerned for the welfare of others’ (5.08), ‘I like to try new foods’ (4.95), ‘purchasing healthy and nutritious food is more important than convenience’ (4.78) and ‘I support those food businesses who are concerned about animal welfare’ (4.68) (Table 4.19).

Table 4.19: Interests

Interests	Mean	Standard Deviation
Healthy eating reduces the risk of disease	5.55	0.88
I support local WA business	5.09	1.13
I am concerned for the welfare of others	5.08	1.06
I like to try new foods	4.95	1.16
Purchasing healthy and nutritious food is more important than convenience	4.78	1.22
I support those food businesses who are concerned about animal welfare	4.68	1.29
I am always willing to pay a premium to secure the best tasting food	4.55	1.18
I have a great interest in supporting more sustainable food production	4.43	1.29
I prefer not to buy imported goods	4.42	1.59
Good health and nutrition are more important than taste	4.34	1.42
I exercise regularly	4.32	1.43
I am opposed to the use of genetically modified organisms (GMO) in food	4.26	1.67
I prefer to purchase foods that are quick and easy to prepare	3.81	1.54

Where 1 is “I disagree a lot”; 6 is “I agree a lot”

4.7 Factor Analysis by grouping into Factors

The decision on bread purchase is a complex process. There are many factors that consumers consider during the purchase of bread. Factor analysis was used to simplify the decision variables by groups into similar categories. In this research study, exploratory factor analysis in SPSS was conducted on the data for variables affecting purchasing decisions on bread to allow for data reduction and to investigate whether the 23 variables can be grouped into similar categories. The method of extraction was the principal component and rotation was varimax. The decision of how many factors were appropriate was based on the Eigenvalue and Cronbach

alpha scores. This resulted in a six factor solution explaining 63% of variance. Factor 1, which was labelled as “product information”, explained 15 percent of variance. Factor 2, which was labelled as “price sensitivity”, explained 11 percent of variance. Factor 3, which was labelled as “bread characteristics”, explained 11 percent of variance. Factor 4, which was labelled as “WA sustainable”, explained 10 percent of variance. Factor 5, which was labelled as “health”, explained 8 percent of variance. Factor 6, which was labelled as “preference”, explained 7 percent of variance (Table 4.20).

Table 4.20: Importance of Variables in Decision-Making

	Factor					
	Product information	Price sensitivity	Bread characteristics	WA sustainable	Health	Preference
In-store tastings/demonstrations	0.783					
Advertising on radio/tv/newspapers	0.768					
Advice from sales assistants	0.755					
Website information	0.741					
Product information in-store	0.706					
Competitive price		0.851				
Price discounts/specials		0.840				
Value for money		0.828				
Texture			0.800			
Taste/flavour			0.710			
Freshness			0.665			
Softness			0.637			
Baked in Western Australia				0.815		
Produced in a sustainable manner				0.786		
Produced under a Fairtrade label				0.731		
Nutritional value					0.795	
Type of grain					0.695	
Organic					0.515	
Brand or label						0.710
Sliced/unsliced						0.677
Buy what the family likes to eat						0.561
Eigen Value	5.130	2.475	2.057	1.366	1.173	1.101
Percentage of Variance (%)	15.41	11.12	10.77	10.44	8.44	7.18
Cumulative Variance (%)	15.41	26.54	37.30	47.74	56.18	63.36
Cronbach's Alpha	0.828	0.829	0.703	0.806	0.564	0.430

When respondents were asked about the importance of factors in the decision to purchase bread, bread characteristics (4.97) was the most important criteria. Most of the respondents also consider preference (4.17), health (3.98), price sensitivity (3.94) and WA sustainable (3.58) as important factors during their decision to purchase bread (Table 4.21).

Table 4.21: Decision Factors in bread purchase

Factors	Mean	Standard Deviation
Bread characteristics	4.97	1.00
Preference	4.17	1.21
Health	3.98	1.15
Price sensitivity	3.94	1.53
WA sustainable	3.58	1.57
Product Information	1.75	0.91

Factor analysis was conducted on the data for health variables affecting purchasing decisions on bread to allow for data reduction and to investigate whether the 15 variables can be grouped into similar categories. The method of extraction was the principal component and rotation was varimax. The decision about how many factors were appropriate was based on the Eigenvalue and Cronbach alpha scores. This resulted in a three factor solution explaining 70% of variance. Factor 1, which was labelled as “product chemicals”, explained 28 percent of variance. Factor 2, which was labelled as “health values”, explained 26 percent of variance. Factor 3, which was labelled as “allergens”, explained 16 percent of variance (Table 4.22). Health values did not load into one factor, but were separated into three clear factors “product chemicals”, “health values”, and “allergens”.

Table 4.22: Health and bread purchase

	Factor		
	Product chemicals	Health values	Allergens
Free from flavour-enhancing compounds	0.905		
Free from chemical residues	0.881		
Free from artificial preservatives	0.875		
May contain genetically modified organisms	0.606		
Healthy – good for me		0.790	
Nutritional value		0.744	
High/added fibre		0.735	
Food energy content – kilojoules/calories		0.625	
Added vitamins and minerals		0.622	
Gluten free			0.853
Potential presence of allergens			0.726
Eigen Value	5.336	1.328	1.052
Percentage of Variance (%)	28.48	25.54	16.14
Cumulative Variance (%)	28.48	54.02	70.15
Cronbach's Alpha	0.914	0.805	0.647

When respondents were asked about the factors of health and their decision to purchase bread, health values (4.10) and product chemicals (3.87) were considered during the purchase of bread (Table 4.23).

Table 4.23: Health and decision factors to purchase bread

Factors	Mean	Standard Deviation
Health values	4.10	1.21
Product Chemicals	3.87	1.68
Allergens	2.75	1.54

Factor analysis was conducted on the data for environmental variables affecting purchasing decisions on bread to allow for data reduction and to investigate whether the 14 variables can be grouped into similar categories. The method of extraction was the principal component and rotation was varimax. The decision of how many factors were appropriate was based on the Eigenvalue and Cronbach alpha scores. This resulted in a two factor solution explaining 72% of variance. Factor 1, which

was labelled as “sustainability”, explained 51 percent of variance. Factor 2, which was labelled as “support WA”, explained 21 percent of variance (Table 4.24).

Table 4.24: Environment and Community and bread purchasing

	Factor	
	Sustainability	Support WA
Greenhouse gas emissions	0.902	
Water use and pollution	0.867	
Waste management	0.866	
Salinity and land degradation	0.845	
Carbon footprint	0.793	
Protecting indigenous culture and land rights	0.777	
Worker welfare	0.756	
Food miles	0.71	
Fairtrade	0.653	
Recyclable packaging	0.647	
Organic	0.589	
Country of origin		0.894
Local (WA) product		0.891
Factor Mean		
Eigen Value	8.075	1.297
Percentage of Variance (%)	50.85	21.25
Cumulative Variance (%)	50.85	72.09
Cronbach’s Alpha	0.951	0.862

Respondents were concerned on the country of origin and local Western Australian produce during the purchase of bread. Support for Western Australia (4.04) product was an important factor during the decision to purchase bread (Table 4.25).

Table 4.25: Sustainability decision to purchase bread

Factors	Mean	Standard Deviation
Support WA	4.04	1.86
Sustainability	2.25	1.29

Factor analysis was conducted on the data for variables for sustainable farming practices to allow for data reduction and to investigate whether the 13 variables can be grouped into similar categories. The method of extraction was the principal

component and rotation was varimax. The decision of how many factors were appropriate was based on the Eigenvalue and Cronbach alpha scores. This resulted in a three factor solution explaining 68% of variance. Factor 1, which was labelled as “environment”, explained 35 percent of variance. Factor 2, which was labelled as “community”, explained 22 percent of variance. Factor 3, which was labelled as “financial”, explained 11 percent of variance (4.26).

Table 4.26: Sustainable Farming Practices

	Factor		
	Environment	Community	Financial
minimise environmental degradation	0.845		
support soil and water conservation	0.800		
minimise the use of chemical inputs	0.777		
encourage the use of organic manures	0.723		
minimise the production of greenhouse gases	0.721		
support ecologically sound development	0.677		
encourage the more efficient use of resources	0.663		
enhance the quality of life for farmers		0.899	
provide adequate economic and social rewards for those involved in food production		0.860	
support rural communities		0.717	
will increase the price of food			0.798
reduce productivity per unit area			0.744
Factor Mean			
Eigen Value	5.571	1.396	1.202
Percentage of Variance (%)	34.7	21.91	11.46
Cumulative Variance (%)	34.7	56.61	68.08
Cronbach's Alpha	0.893	0.837	0.447

Respondents agree that sustainable farming practices will help the environment (5.19) and community (4.90) (Table 4.27).

Table 4.27: Factors affecting decision to purchase

Factors	Mean	Standard Deviation
Environment	5.19	0.89
Community	4.90	1.12
Financial	3.86	1.25

Factor analysis was conducted on the data for variables in bread labelling to allow for data reduction and to investigate whether the 17 variables can be grouped into similar categories. The method of extraction was the principal component and rotation was varimax. The decision about how many factors were appropriate was based on the Eigenvalue and Cronbach alpha scores. This resulted in a four factor solution explaining 70% of variance. Factor 1, which was labelled as “ingredients”, explained 22 percent of variance. Factor 2, which was labelled as “product made”, explained 17 percent of variance. Factor 3, which was labelled as “health assurance”, explained 16 percent of variance. Factor 4, which was labelled as “gluten free and organic”, explained 15 percent of variance (Table 4.28).

Table 4.28: Information of food labels

	Factor			
	Ingredients	Product made	Health assurance	Gluten free and organic
The amount of fat	0.832			
The amount of sugar	0.827			
The amount of salt (sodium)	0.759			
Where the product was made		0.872		
Where the ingredients were sourced from		0.825		
Heart Foundation endorsement			0.873	
Quality assurance label			0.766	
Gluten free				0.781
Product is organic				0.778
Factor Mean				
Eigen Value	2.551	1.442	1.231	1.107
Percentage of Variance (%)	22.45	17.38	15.98	14.53
Cumulative Variance (%)	22.45	39.83	55.81	70.34
Cronbach's Alpha	0.740	0.693	0.604	0.383

4.8 Correlation

Correlation describes the degree of relationship between two variables. In this research study, Pearson's correlation was used to determine the relationships between variables.

The results in the Pearson correlation table shows that as one variable increases in value, the second variable also increase in value. Similarly, as one variable decreases in value, the second variable also decreases in value. This is called a positive correlation.

Product chemicals are positively correlated to health values (0.580^{**}), allergens (0.544^{**}) and sustainability (0.529^{**}). Sustainability and WA sustainable are positively correlated (0.541^{**}), significant at $p \leq 0.05$. Price sensitivity are positively correlated to bread characteristics (0.251^{**}), WA sustainable (0.126^{**}) and preference (0.316^{**}) and health values (0.151^{**}) (Table 4.29).

Table 4.29: Pearson Correlation Table

	Product Information	Price sensitivity	Bread characteristics	WA sustainable	Health	Preference	Product Chemicals	Health values	Allergens	Sustainability	Support WA	Environment	Community	Financial
Product Information	1													
Price sensitivity	.245**	1												
Bread characteristics	.222**	.251**	1											
WA sustainable	.462**	.126*	.271**	1										
Health	.272**	.047	.240**	.397**	1									
Preference	.202**	.316**	.355**	.197**	.166**	1								
Product Chemicals	.312**	.005	.211**	.579**	.477**	.153**	1							
Health values	.258**	.151**	.195**	.365**	.519**	.225**	.580**	1						
Allergens	.275**	.029	.203**	.354**	.389**	.109*	.544**	.449**	1					
Sustainability	.403**	.046	.128*	.524**	.345**	.127*	.529**	.365**	.378**	1				
Support WA	.178**	.004	.045	.537**	.259**	.107*	.438**	.237**	.183**	.541**	1			
Environment	.108**	-.021	.144**	.223**	.305**	.082	.292**	.277**	.198**	.264**	.232**	1		
Community	.137**	-.020	.099	.251**	.162**	.072	.271**	.267**	.119*	.294**	.224**	.559**	1	
Financial	.131*	.032	.059	.248**	.164**	.029	.244**	.230**	.203**	.162**	.125*	.285**	.205**	1

** means significant, p value < 0.05

4.9 Regression Analysis

The model in page 42 was tested using multiple regression. Allergens, support WA, and trust made in WA were not significant when compared with willingness to pay for bread produced under a sustainable manner (Table: 4.30).

Table 4.30: Willingness to pay regression model

Independent Variables	Standardised Coefficients (Beta)
Gender	.019
Age	.010
Income	.011
Knowledge of labels	.106
Product Information	-.050
Price Sensitivity	-.252**
Product Characteristics	-.007
WA Sustainable	.182**
Health	.183
Preference	-.028
Product Chemicals	-.121
Health Values	-.118**
Allergens	-.054
Sustainability	.146
Support WA	-.094
Environment	.210**
Community	-.035
Financial	.052
Find certification adequate	.119**
Check label frequency	.132**
Trust made in Australia label	-.034

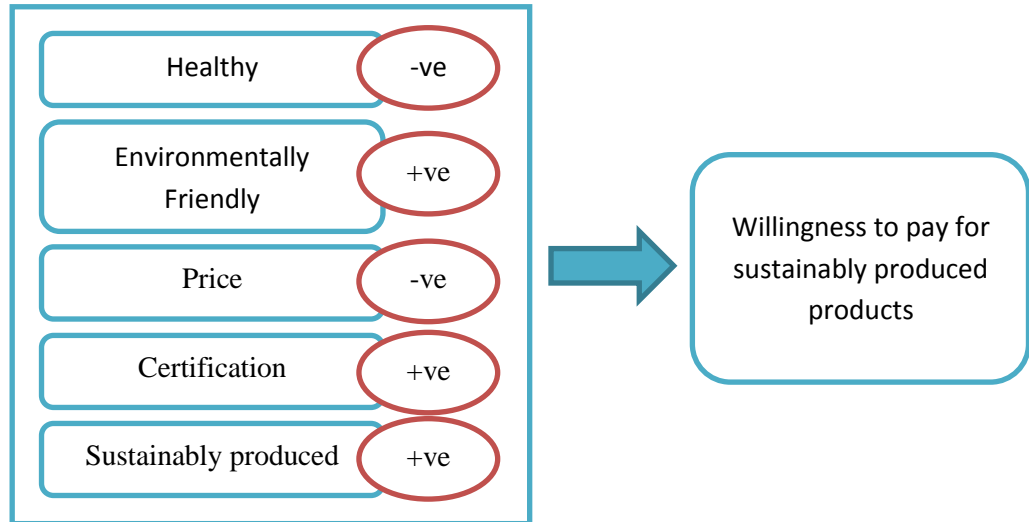
$R^2=0.306$, Adjusted $R^2= 0.248$; ** means significant, p value < 0.05

Price sensitivity and health values have a negative relationship with willingness to pay for bread produced under a sustainable manner. The variables with a positive relationship with the willingness to pay were WA sustainable, environmentally friendly, find certification adequate and check label frequency.

Respondents were not willing to pay extra for the higher price of the products. The nutrition and health factors did not increase the willingness to pay for premiums for sustainable products. Respondents were happy to pay more for sustainable products

for the sustainable factors, views of the products being better for the environment, proper certification and labelling.

Figure 4.8: Research Model



4.10 Summary

In this study, females are still the primary grocery shoppers. Bread is purchased from retail outlets from Coles and Woolworths, and IGA. Due to bread having a short shelf life, it is being purchased frequently at least once a week. Mixed or multigrain, wholemeal and white bread are the common bread purchased. Bread is consumed commonly as toast and sandwiches.

The important factors influencing purchase decisions include freshness, health and price. There is little recognition in certifications as the majority of the respondents could not recognise the labels.

Majority of the respondents were willing to pay a premium for sustainable bread. However, price and health did not have a relationship with the willingness to pay for sustainable bread. Higher price and health values were not evident in respondents' willingness to pay a premium for sustainable bread. Willingness to pay for sustainable bread was evident in positive relationship with sustainable, environment, certification and labelling factors.

The next chapter will discuss the results findings comparing them to previous findings from previous researchers. The next chapter will also include personal thoughts and findings from articles supporting the results from this study.

Chapter 5: Discussion

This chapter discusses the results and supporting them against relevant studies conducted by previous researchers. Although the majority of findings in this study supports previous research, there are a few sections that were new and interestingly different, compared to previous findings which will be discussed at each section.

5.1 Demographic

During the study, the majority of respondents were female (67%). This suggests that females continue to do the majority of household shopping. Previous consumer behaviour research conducted by Batt and Liu (2012) has also found that females were the major respondents (67%). Harmon and Hill (2003) and Anic, Radas and Miller (2011) also found that women remain the primary purchasers of grocery items in their household.

The age composition of respondents indicated that respondents were mature enough to respond on various issues including open-ended questions and bread consumption factors. Out of the total respondents, 58 percent of the respondents were aged between 26 and 54 years.

The study indicates that 58 percent of respondent's income level in household was more than \$75,000. This was fairly consistent with household income distribution conducted by Australian Bureau of Statistics (ABS 2015). A total of 66 percent of respondents were white collar workers, which shows the education profile of respondents. This supports that respondents have enough knowledge relating to the products purchased.

Australia is a multicultural country and is supported by this study, with a total of 47 percent of households not born in Australia. Previous research conducted by Ng and Metz (2015) supports that Australia is a multicultural country. This is also supported by ABS (2015), with Western Australia having high overseas born residents. The different type of cuisines consumed in respondents' households also supports the multiculturalism of Western Australians in this research.

Table 5.1: Socio-demographic profile

Socio-demographics		Frequency	Percentage (%)
Gender	Male	127	32.4
	Female	265	67.6
Age	18-25 Years	17	4.3
	26-34 Years	59	15.1
	35-44 Years	84	21.4
	45-54 Years	84	21.4
	55-64 Years	90	23.0
	Over 65 Years	58	14.8
Income	Less than \$6,000	8	2.0
	\$6,001- \$30,000	42	10.7
	\$30,001- \$75,000	97	24.7
	\$75,001- \$150,000	149	38.0
	More than \$150,001	77	19.6
Occupation	Retired	63	16.8
	White Collar	249	66.2
	Blue Collar	64	17.0
Born in Australia	Yes	207	52.8
	No	185	47.2
Children <18 years	Yes	114	29.1
	No	279	71.2

5.2 Bread consumption and purchase

The majority of consumers do not bake their own bread at home. It is evident that consumers are increasing the consumption of processed and ready-use products which are time saving and easily prepared foods (Casini et al. 2015). The increasing number of working women has driven the desire for convenience, resulting in a strong growth of time-saving packaged food products (Pradeepa and Kavitha 2013). Respondents mainly purchase their bread from retail giants such as Coles and Woolworths which have dominated the Australian grocery business. This was supported by Roy Morgan research (2014) where Woolworths and Coles dominated more than three thirds of the market share. There is also evidence from previous research consumers shopping at large retail stores for their store image, location, and the one-stop shopping trip, where a wide variety of products are available (Ali, Kapoor and Moorthy 2010; Gerhard and Hahn 2005). Research conducted by Hino

(2014), also supports the reason why consumers prefer shopping at large retail stores providing a wide variety of perishables at a higher quality and fresher products, and a better shopping experience.

There has been a shift in consumer purchasing habits, as consumers are moving away from traditional bakery stores. Although retail bakery shops had the mean value of 18, it is evident that there is a moderate percentage of consumers who purchase bread from traditional bakery stores. This supports that bakeries still have a position in the market for their store loyalty and competitive difference. This was supported by Miranda and Joshi (2003) that bakery stores are unique and different from manufacturer brands and other store brands, whereby consumers do not consider prices and are highly satisfied with the private labelling.

Bread purchase was done at least once a week, with the quantity of one to two loaves being purchased on each occasion. This was supported by Ali, Kapoor and Murty (2010) where products which are highly perishable are purchased frequently. This study indicates that 74 percent of respondents freeze their bread at home. This suggests that consumers value freshness. As bread is a high perishable food product with short shelf life, to extend the shelf life and freshness of bread, the method used was freezing. This was supported by Tsiros and Heilman (2005), where consumers freeze perishable products to stop the aging process regardless of the number of days before its expiration date.

Mixed or multigrain, wholemeal and white bread accounts for the majority type of bread consumed. This was supported by ABS (2014), where mixed grain, wholemeal and white bread were the popular breads consumed. The dominant purchase of wholegrain and white bread was also supported by Hellyer, Fraser and Haddock-Fraser (2014) and Van Woensel et al (2007). With previous research conducted by Annett et al. (2008), it is evident that respondents react positively to healthy options. Bitzios, Fraser and Haddock-Fraser (2011) also found that consumers actively value health benefits and are more willing to pay more for wholegrain products. Bread was most frequently purchased in the form of loaf and bread rolls, and consumed as toast breads and sandwiches. This was also supported by ABS (2014) where majority of bread was consumed as sandwiches and toast.

5.3 Factors influencing bread purchase

The questionnaire was designed based on normal bread purchasing attitudes. The mean value of the consumer's response to open-ended questions indicates that freshness is the most important factor influencing bread purchase. This is evident, as 75% consumers purchase their bread at least once a week. The other important attributes are then followed by health, price, and preference. Lennernas et al (1997) also found that in his study, European consumers mentioned that the five most important factors influencing food choice were freshness, price, taste, eating healthy and family preference. This is also evident in the research conducted by Ali, Kapoor and Moorthy (2010), where consumer behaviour is affected by attributes such as variety, price, convenience, packaging, and freshness. Cardello and Schutz (2003) reported their findings on the importance of freshness, which is ranked below taste and nutrition, and on par with price and convenience attributes.

This study also supports the importance of factors during the purchasing decisions of bread. During the likert scale, respondents again ranked freshness as the most important variable. The other important variables were then followed by taste and flavour, nutritional value, texture, sliced or unsliced, type of grain, buy what the family likes, softness, value for money, baked in Western Australia, competitive price and shelf life. This was revealed by Grundvag and Ostli (2009) where consumers evaluate freshness based on visual appearance of product, touch and smell to determine the quality. Attributes such as taste and texture were then determined by the consumer after the product was purchased and consumed (Swahn et al. 2012).

During food shopping, consumers are usually under time pressure, thus affecting their purchasing decision. Consumers tend to go for products with which they are experienced and familiar to reduce the amount of uncertainty, time, effort and negative emotions during product purchase (Koenigstorfer and Groeppel-Klein 2010). Van Woensel et al (2007) found that consumers are not only interested in a specific type of bread, but also make their choice on the characteristics of bread. If a consumer's first choice of bread is not available, the consumer will substitute the bread with a bread type with the most similar characteristics to their first choice.

This supports the theory that bread purchasing attitude is routine, where not much effort is used during the decision to purchase bread.

Respondents were highly concerned about the locality of the product. It was evident in this research that consumers value the variables of local Western Australian product and the country of origin of products purchased. However, Ahmed et al (2004) reports that brand was the most important attribute for bread purchasing, followed by country of origin and price. Country of origin was not the most important attribute as bread was mainly purchased as a habit. Bread purchasing habits were based on the frequency, familiarity and popularity of brand. It was also evident that consumers prefer the locally made bread products over overseas product.

5.4 Food label and bread purchase

This study supports that 79 percent of consumers refer to labels during the purchase of bread. This was supported by Batlas (2001), where 80 percent of the surveyed respondents refer to labels and that the label information affects their decision to purchase. The most important information consumers refer to was the use by date or best before date of the product. The consumer's attitude towards use-by-date or best-before-date is due to the high perishability of bread product. Consumers will choose the product with longer use-by-date or best-before-date with the willingness to pay a reduced price products with increasing age; and perception of shorter shelf life products having reduced quality (Amorim, Costa and Almada-Lobo 2014). The findings again support the freshness factor that consumers use to purchase bread, and use by date determines freshness including the storage life. This is also supported by Miranda and Konya (2006) that use-by-date is important information that consumers use to determine foods that are highly perishable.

In this study, respondents look at other information including the amount of sugar, where product was made, amount of fat and food additives used in the product. This supports that consumers value the locality of the product (Ahmed et al. 2004). Consumers place more importance on the fat, sugar and food additives content as they are health conscious. Fat, sugar and food additives are perceived as unhealthy ingredients. Thus, these negative ingredients are being referred to more often. Batlas

(2001) also supports that consumers place more importance on negative food components such as fats, sugar and food additives when referring to labels.

It is evident that consumers refer to food labels for nutrition and health awareness. Thus, this supports the study that consumers value nutrition, health and product safety over taste. The general food concerns consumers expressed in previous studies were food quality, ethical issues, price, information and how the food is produced. Health concerns were mainly specified on relations to food contamination including pesticides, additives and excess amounts of sugar, fat and salt in food (Harper and Makatouni 2002).

However, information on accredited labels was not widely known by consumers. In this study, consumers have very little knowledge on quality assurance labels as majority of consumers do not recognise accredited labels. This study also found that more than half of the respondents (52%) did not find the level of certification adequate. The main reasons for respondents not finding the level of certification adequate were the lack of education and the lack of recognition for most of the certified labels. Consumers were also dissatisfied that the logos were not clear or were too small. Also, consumers did not trust the level of certification as they were unsure of the certification standards which can be a marketing tool from manufacturers. Previous research also found that consumers view the certified product to be a fad (Lea and Worsley 2005). Harper and Makatouni (2002), has also found that consumers doubted the certification system, with criticisms in regards to how the food was regulated and licensed. This is mainly due to the lack of trust consumers have in government and the food industry, and this perception for these certification systems will be a key barrier to purchasing products with such labels.

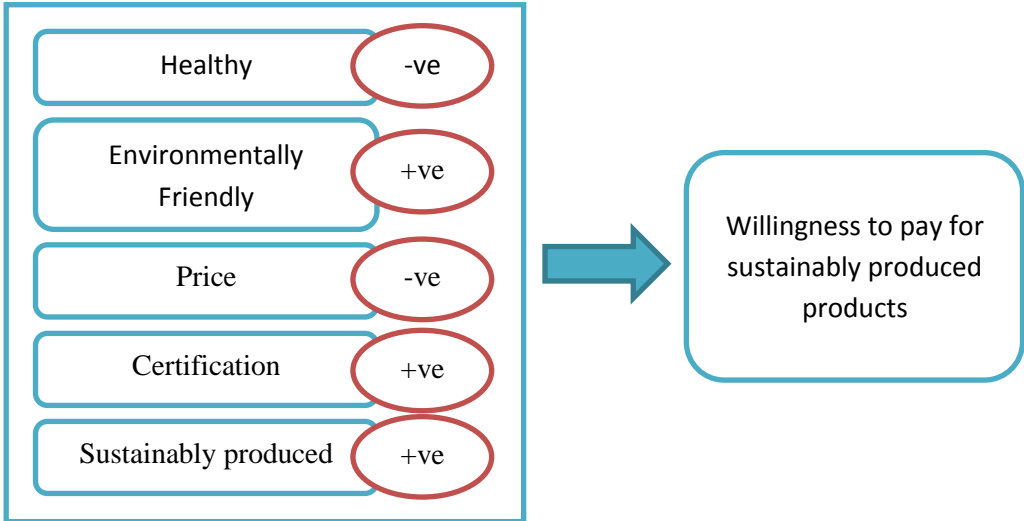
5.5 Sustainability and Willingness to Pay for sustainable bread

In this study it is clear that consumer awareness of sustainability is very high among respondents. 73% of respondents define the word “sustainability” as good for the environment. The definition of sustainability defined includes less impact to the environment, ensure farming for future generation, efficient use of and, reduce use of chemicals, prevention of salinity and erosion, reduce waste, and recycling.

Respondents also view sustainability as good for the community (8%), producing healthier products (7%), price concerns (2%), supports local product (2%), and increasing interest in food standard and safety (2%). There was also a small percentage (8%) of consumers who did not know what sustainability means and had no interest in sustainable products.

In this study, environmentally friendly (0.210), sustainably produced (0.182), and certification (0.119) have a positive relationship with willingness to pay for bread produced under a sustainable manner (Figure 5.1). This supports that consumers are willing to pay more for environment friendly bread production. Chekima et al (2015) supports the finding that environmentally conscious and certification labels have a positive relationship towards willingness to pay. Cholette at al (2013) also identified a small but strong segment that value locality of products and are willing to purchase regardless of the price factor. This indicates that consumers who are concerned about the environment are taking measures to prevent further environmental deterioration by having a positive relationship towards willingness to pay for sustainable products. This study also indicates the awareness and trust in certification labels. Consumers who are satisfied and aware of the certification labels are showing positive relationship with willingness to pay. From this, we can confirm that the certification labels are valuable in helping consumers purchasing decision.

Figure 5.1: Relationship with willingness to pay for sustainable bread



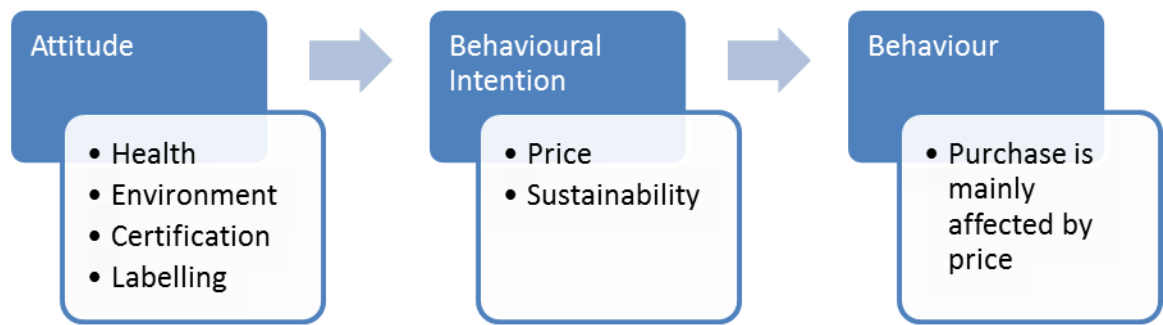
In this study, there is a segment of the population who are price sensitive. Price Sensitivity (-0.272) and health (-0.118) have a negative relationship with willingness to pay (Figure 5.1). This supports the fact that consumers who were price sensitive will not pay extra for bread produced under a sustainable manner. These consumers are the ones who purchase according to price factors for value for money and lower prices. This was supported by Fotopoulos and Krystallis (2002), where a cluster of price sensitive customers was identified. Cholette et al (2013) also identified price conscious consumers who will choose the cheapest products as they are unlikely to be interested in the product unless it is low in cost. Consumers were not willing to pay more for healthier bread. This finding was supported by Tarkiainen and Sundqvist (2005) and Suki (2013), indicating that the relationship between health consciousness is not significant during organic and bread flour purchase in the Indian market. Lea and Worsley (2005) also found that in their research, consumers were positive about organic products in regards to health, the environment and taste. They have also found that cost and availability were the main reasons why consumers do not purchase organic products. This is also due to mistrust in the labelling of organic products. Lea and Worsley also found that environmental concerns, perceived environmental benefits and environmental behaviours are positively related to organic consumption. Consumers are willing to pay a premium for quality products and products that are perceived to have improved environmental performance.

During the purchase of products, consumers expressed concerns about animal welfare, fair trade, the environment and supporting small local organic producers. There were also studies supporting that welfare and health issues were the reasons why some consumers have switched to a vegetarian diet (Harper and Makatouni 2002).

Attitudes in the theory of reasoned action model are complex. It incorporates cognitive, beliefs and feelings. The intention to purchase sustainably produced bread, is determined by personal attitudes and perceived attitudes. Therefore, a person's beliefs and feelings about sustainably produced bread, which has positive advantages to the environment, do not directly determine their behaviour towards it. There is a series of mediating stages which mediate between attitudes and behaviour. Thus, the theory of reasoned action does not appear to explain the behaviour well.

In many cases, attitude does not predict the behaviour. Many studies have reported a very low correlation between consumers' reported attitudes towards their actual behaviour towards the product (Tsakiridou et al. 2008). Researchers developed the theory of reasoned action to improve the predictive ability.

Figure 5.2: Attitude vs Behaviour



In this study, subjective norms were not measured. The attitudes of bread purchasing identified were health, environment, certification and labelling. However, price is the main factor driving purchase decisions in consumer behaviour.

5.6 Theoretical Contribution

The consumer behaviour model used in this study was relevant showing that although food products are indeed a habitual purchase, there are still certain factors that influence consumer attitudes. The theory of reasoned action model appears to not explain the actual behaviour very well.

In this study, it was identified that there was a consumer segment who were price sensitive and would not pay extra for sustainable bread. Health value also had a negative relationship with willingness to pay for sustainable bread. Sustainability, environment and certification factors had a positive relationship towards willingness to pay for bread produced under a sustainable manner.

This study adds the knowledge that health values had no relationship with the willingness to pay for sustainable bread. Consumers who have knowledge of sustainability, or are concerned for the environment, are willing to purchase

sustainably produced bread. Although health, environment, certification and labelling were attitudes affecting behaviour, price still plays an important role during purchasing decision.

5.7 Implications

This research has identified that there was a lack of education in the understanding and recognition of certification labels. Although products were available on market shelves, consumers do not understand the different certification labels and their benefits to the environment. Thus, it is important to increase awareness of sustainability, and more detailed information should be provided for sustainable products. This will, in turn, increase the support of sustainably produced products with the benefits of environmentally friendly and healthier eating options. The government should play a more important role by making the public more aware of the importance of sustainably produced food. This can be done through advertisements, which has been seen often with 'go for 5 vegetables and 2 fruits' to promote healthy eating.

Pricing has been an issue for sustainably produced products. While marketing food products, manufacturers should consider producing products packaged in smaller amounts and price themselves competitively to conventional products. Bread products labelling for sustainable labels should be made more visible so that consumers can compare and differentiate the product.

In this research, respondents were reluctant to purchase certified labelled products due to the lack of trust in regulations. It will be beneficial for regulators to list how certification is obtained to increase the trust of consumers for certified products. During this process, consumers will also be educated on the different certification labels, which will lead to increasing support of sustainable products.

5.8 Limitations

In this study, there were a few limitations with data collection. Due to high rejection rates when completing the questionnaire on the spot, some important information

from respondents may have been mislaid. Some respondents were actually more interested in farmers being paid more for their products. At the end of the questionnaire, they indicated that they were interested to pay more if there was a way to tell that farmers were paid a better price and that the food produced is sustainable.

There was no way to differentiate if respondents were already supporters of sustainable product purchasing as no question were directly asked on this topic. Therefore, it was not possible to measure the current trends of sustainable food purchasing nor was it possible to determine future trends.

Another limitation with this research was that the data collected was rather old. Within the three years of data collection, consumers may have developed different habits. Bread products purchased may also have changed over the years with more alternatives to bread contents available in the market. The data collected was also gathered in geographical areas of Western Australia which were considered 'average to wealthier' suburbs.

Bread consumption in Australia has also changed with some bakeries charging premium prices for high quality bread, which costs up to \$10 a loaf. Some restaurants were also charging a premium for sustainably produced bread, for those customers who were willing to pay extra for sustainable produced bread.

5.9 Future research

For future research, it would be interesting to measure the actual behaviour of respondents towards environmental concerns. This would demonstrate the importance of the environment in terms of use of solar panels, and other behavioural habits such as reducing the use of paper, recycling food compost, and fuel-efficient vehicles. Furthermore, it would be interesting to include questions to measure if the respondents also support sustainable farming practices by already purchasing sustainably produced products. This will indicate the current sustainable market and future market.

Future researchers should minimise the number of questions, making the overall questionnaire shorter and more precise. With the 15 minute questionnaire, many

customers declined to take part, due to the 15 minutes required to complete the questionnaire. Making the questionnaire shorter would encourage a better response rate and higher accuracy in measuring the overall population of bread consumption in Western Australia.

5.10 Conclusion

Bread remains a main food consumed in Western Australia households on a regular basis. The most commonly consumed bread includes mixed or multigrain, wholemeal and white bread. The majority of bread consumed is purchased from retail outlets from Coles, Woolworths and IGA. Bread is being purchased on a regular basis due to the short shelf life.

The factors consumers prioritise in the purchase of bread include freshness, health, price and preference. Although effect is small, consumers do put high value into supporting local products with increasing interest of locally produced food products. There are factors that consumers consider during the purchase of bread; however, price plays an important role in behaviour.

Due to rapid changes in preference and consumer behaviour, supermarket culture is rapidly changing. This resulted in consumers going towards convenience purchasing and the desire for readily available food products. It is important that manufacturers can provide consumers with their needs and preference. Consumers are also increasing their demand for quality food and are becoming more conscious of health and food safety issues.

Food labelling should remain informative to consumers as it affects decision purchasing. As food products such as bread has a high perishability rate and short shelf life, use-by-dates are important as they are referred to as freshness during purchase. Health factors and locality of products are important in the decision-making of food product purchasing.

Consumers are increasing their concerns for the environment. Consumers are willing to pay a premium for quality products and products that are perceived to have improved environmental performance. From this research, it is concluded and

evident that consumers are willing to pay extra for sustainable products. Although there is a segment of consumers who are price sensitive and are not willing to pay extra for sustainable products, there is an identified market of consumers who are health conscious and environmentally conscious.

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Appendix 1: Structured Interview and Questionnaire

Consumer Attitudes for Sustainable Production Practices in Western Australia

The aim of the project is to investigate your bread purchasing behaviour and experiences in retail stores. The project also aims to investigate your knowledge of sustainability. This also includes the importance of sustainability and attitudes towards sustainable food products in your purchase of bread from a retail store, as well as your willingness to pay for sustainable products and to support sustainable farming practices.

If you would like to participate in this research, you will be completing a questionnaire which will take approximately 20 to 30 minutes. The questionnaire is easy to complete, according to your past purchases for bread products.

I would like to assure you that all the information we collect will be kept in the strictest confidence and used for research purposes only. Only the researcher and the supervisor will have access to the raw data. From the data that we collect, analyse and publish, it will not be possible to identify any individual.

There are no risks in participating in this research as all information obtained will be kept with strict confidentiality. Your participation in this survey is completely voluntary. Should you find it necessary, you may withdraw at any time without prejudice.

The benefits in participating in this research are that you may realise your habits and the important criteria you consider during bread purchasing.

This project has been approved by the Curtin University Ethics Committee (Approval No. SOM-21-2012). Should you find it necessary to consult the project supervisors or the Secretary of the Human Research Ethics Committee, via the contact details provided, please refer to the contact details below.

HREC (Human Research Ethics Committee of Curtin
University)

hrec@curtin.edu.au 08 9266 2784

C/- Office of Research and Development
Curtin University of Technology
GPO Box U1987, Perth WA 6845

Structured Interview

Hello.

My name is Sharon Ung.

I am a research associate employed by Curtin University to undertake market research for and on behalf of the grains industry in Western Australia.

In your household, are you personally involved in the decision to purchase food?

Yes Proceed

No Thank the respondent

Have you purchased bread from a retail store at any time within the last three months?

Yes Proceed

No Thank the respondent

Can you provide me with approximately 15 minutes of your time to assist with this survey?

Yes Proceed

No → Would you be willing to complete this survey at home and to return your completed survey in the self-addressed reply-paid envelope?



Yes Give the documents and envelope to the respondent

No Thank the respondent

Questionnaire

1. Do you or does anyone else within your household bake/make any of the bread that is consumed within your household? Please circle your response.

1. Yes
2. No

2. What percent of the fresh bread that is consumed within your household do you:

	%
bake yourself from ingredients	
bake yourself from frozen dough	
purchase from a retail outlet	
obtain as a gift from friends and family	
obtain from other sources	
consume as takeaway	
	100%

Please ensure that this total = 100%.

3. For the bread that you purchase, from where do you ordinarily buy it? Please tick ALL of those retail outlets from where you usually purchase bread. Approximately, what percent of the bread that you buy do you ordinarily purchase from EACH of these outlets? Please ensure that the total = 100%

	√	%
Coles and Woolworths		
independent supermarkets (IGA)		
convenience stores or deli		
petrol stations		
retail bakery shop		
gourmet food shop/health shop		
growers markets/fresh produce markets		
Internet		
		100%

4. On average, how often do you purchase fresh bread from a retail outlet? Please circle the appropriate response.

1. daily
2. 2-3 times per week
3. once a week
4. one time every two weeks

5. Do you freeze some or all of the bread that you purchase in your household?

1. Yes
2. No

6. On each occasion that you purchase bread, how many loaves do you purchase?
..... loaves

7. Can you recall how much you paid to purchase the last loaf that you bought?

.....

8. Is the bread that you most often buy:

1. sliced

2. unsliced

Please circle your answer

9. What type of bread do you most often purchase?

Please qualify your answer on a 4 point scale where 1 is “not at all”, 2 is “not often”, 3 is “sometimes” and 4 is “regularly”

White	1	2	3	4
Fibre enhanced white	1	2	3	4
Wholemeal	1	2	3	4
Mixed or multi grain	1	2	3	4
Mixed with chia/soy/linseed	1	2	3	4
Rye/spelt	1	2	3	4
Sour dough	1	2	3	4
Flat or pita	1	2	3	4
Lupin	1	2	3	4
Gluten Free	1	2	3	4
Others	1	2	3	4
Please specify				

10. In what form do you most often purchase bread?

Please qualify your answer on a 4 point scale where 1 is “not at all”, 2 is “not often”, 3 is “sometimes” and 4 is “regularly”

Bread rolls (round)	1	2	3	4
Bread sticks	1	2	3	4
Chapatti	1	2	3	4
Crusty Vienna	1	2	3	4
Dinner rolls	1	2	3	4
Fruit loaf	1	2	3	4
Garlic bread	1	2	3	4
Loaf	1	2	3	4
Naan bread	1	2	3	4
Roll (assorted) bread	1	2	3	4
Pita	1	2	3	4
Pull apart pack roll	1	2	3	4
Savoury bread	1	2	3	4
Sweet bread	1	2	3	4
Turkish Bread	1	2	3	4
Wraps	1	2	3	4
Others	1	2	3	4
Please specify				

Please continue

11. In your household, in what ways is bread eaten?

Please qualify your answer on a 4 point scale where 1 is “not at all”, 2 is “not often”, 3 is “sometimes” and 4 is “regularly”

Sandwiches	1	2	3	4
Toast bread	1	2	3	4
With soups	1	2	3	4
As a pudding	1	2	3	4
As a snack	1	2	3	4
Stuffing for roast meats	1	2	3	4
Others	1	2	3	4
Please specify				

12. In making your decision to purchase bread, what factors were most influential in your choice/selection?

.....

.....

.....

.....

.....

13. On a scale of 1 to 6 where 1 is “not at all important” and 6 is “very important”, how important is EACH of the following variables in your decision to purchase fresh bread? Please circle the desired response.

	Not at all Important			Very important		
	1	2	3	4	5	6
Type of grain	1	2	3	4	5	6
Size or weight of the loaf	1	2	3	4	5	6
Sliced/unsliced	1	2	3	4	5	6
Brand or label	1	2	3	4	5	6
Competitive price	1	2	3	4	5	6
Taste/flavour	1	2	3	4	5	6
Texture	1	2	3	4	5	6
Softness	1	2	3	4	5	6
Nutritional value	1	2	3	4	5	6
Buy what the family likes to eat	1	2	3	4	5	6
Organic	1	2	3	4	5	6
Freshness	1	2	3	4	5	6
Shelf life/storage life	1	2	3	4	5	6
Value for money	1	2	3	4	5	6
Baked in Western Australia	1	2	3	4	5	6
Produced in a sustainable manner	1	2	3	4	5	6
Produced under a Fairtrade label	1	2	3	4	5	6
In-store tastings/demonstrations	1	2	3	4	5	6
Product information in-store	1	2	3	4	5	6
Advertising on radio/tv/newspapers	1	2	3	4	5	6
Advice from sales assistants	1	2	3	4	5	6
Price discounts/specials	1	2	3	4	5	6
Website information	1	2	3	4	5	6

14. Thinking for one moment about the product itself, on a scale of 1 to 6 where 1 is “I never think about it” and 6 is “I always think about it”, how often do you think about EACH of the following variables in your decision to purchase fresh bread? Please circle the desired response.

I never
think about

I always
think about

Healthy – good for me	1	2	3	4	5	6
Food energy content – kilojoules/calories	1	2	3	4	5	6
Safe to eat	1	2	3	4	5	6
Free from chemical residues	1	2	3	4	5	6
Free from flavour enhancing compounds	1	2	3	4	5	6
Free from artificial preservatives	1	2	3	4	5	6
Low salt	1	2	3	4	5	6
Low fat	1	2	3	4	5	6
Low GI	1	2	3	4	5	6
Nutritional value	1	2	3	4	5	6
High/added fibre	1	2	3	4	5	6
Added vitamins and minerals	1	2	3	4	5	6
Potential presence of allergens	1	2	3	4	5	6
May contain genetically modified organisms	1	2	3	4	5	6
Gluten free	1	2	3	4	5	6

15. Thinking for one moment about the way in which bread is produced, on a scale of 1 to 6 where 1 is “I never think about it” and 6 is “I always think about it”, how often do you think about EACH of the following variables in your decision to purchase fresh bread? Please circle the desired response.

I never
think about

I always
think about

Salinity and land degradation	1	2	3	4	5	6
Water use and pollution	1	2	3	4	5	6
Greenhouse gas emissions	1	2	3	4	5	6
Waste management	1	2	3	4	5	6
Organic	1	2	3	4	5	6
Recyclable packaging	1	2	3	4	5	6
Food miles	1	2	3	4	5	6
Carbon footprint	1	2	3	4	5	6
Country of origin	1	2	3	4	5	6
Local (WA) product	1	2	3	4	5	6
Fairtrade	1	2	3	4	5	6
Worker welfare	1	2	3	4	5	6
Protecting indigenous culture and land rights	1	2	3	4	5	6
Meets halal or kosher requirements	1	2	3	4	5	6

16. Do you trust the ‘made in Australia’ label on packaging of bread purchased?

1. Yes
2. No

17. There is within the Australian grains industry, an increasing recognition of the need to adopt more sustainable farming practices. As a consumer, what does “sustainable farming practices” mean to you?

.....

.....

.....

.....

.....

18. Below are a number of statements that endeavour to describe sustainable farming practices. Please indicate the extent to which you agree or disagree with EACH statement, on a scale of 1 to 6 where 1 is “I disagree a lot” and 6 is “I agree a lot”

I disagree
a lot

I agree
a lot

Sustainable farming practices...	1	2	3	4	5	6
support soil and water conservation	1	2	3	4	5	6
minimise the use of chemical inputs	1	2	3	4	5	6
encourage the use of organic manures	1	2	3	4	5	6
reduce productivity per unit area	1	2	3	4	5	6
minimise environmental degradation	1	2	3	4	5	6
minimise the production of greenhouse gases	1	2	3	4	5	6
support rural communities	1	2	3	4	5	6
support ecologically sound development	1	2	3	4	5	6
enhance the quality of life for farmers	1	2	3	4	5	6
provide adequate economic and social rewards for those involved in food production	1	2	3	4	5	6
provide sufficient nutritional value	1	2	3	4	5	6
encourage the more efficient use of resources	1	2	3	4	5	6
will increase the price of food	1	2	3	4	5	6

19. As the implementation of sustainable farming practices is most likely to come at a cost, assuming that it costs AUD 4.50 to purchase a loaf of bread from a retail store, what additional cost, if any, would you be willing to pay to support more sustainable farming practices? Please circle your answer.

- | | |
|-------------|---------|
| 1. No more | \$ 4.50 |
| 2. 10% more | \$ 4.95 |
| 3. 15% more | \$ 5.17 |
| 4. 20% more | \$ 5.40 |
| 5. 25% more | \$ 5.63 |
| 6. 30% more | \$ 5.85 |

20. If you answered no more for Question 19, please go to Question 21.

Having indicated in the question above that you are willing to pay more for bread that has been produced under sustainable farming practices, to what extent does your willingness to pay extend to other food products? Would you pay the same premium for these products? Please circle your answer.

	Assumed cost	Yes	No	I don't consume this product
Breakfast cereals (per box)	7.50	1	2	3
Crackers/plain biscuits	3.50	1	2	3
Beer (per carton)	45.00	1	2	3
Milk (per litre)	2.50	1	2	3
Eggs (one dozen)	6.00	1	2	3
Chicken meat (per kg)	9.50	1	2	3
Beef (per kg)	26.00	1	2	3

21. In order to demonstrate that farmers, food processors and manufacturers have implemented more sustainable farming practices, a number of third party accredited quality assurance systems have been introduced within the food industry. Which of the following, if any, do you recognise? Please circle your response.

	Yes	No
GLOBALG.A.P.	1	2
	1	2
	1	2
	1	2
	1	2
	1	2

	Yes	No
	1	2
	1	2
	1	2

22. Do you find the level of certification adequate?

1. Yes
2. No

If No, why not?

.....

.....

.....

23. When you purchase bread, how frequently, if at all, do you refer to the label information? Please circle your response.

1. Never
2. Rarely
3. Occasionally
4. Usually
5. Always

If you answered NEVER please go to Question 25.

Please continue

24. When you do refer to information on food labels, what information do you usually look for? Please circle the appropriate response for EACH variable.

	Yes	No
The amount of salt (sodium)	1	2
The amount of fat	1	2
The amount of sugar	1	2
Glycemic index (GI)	1	2
Any added vitamins/minerals/fibre	1	2
Gluten free	1	2
Calories (kilojoules)	1	2
Food additives (artificial colours and/or preservatives)	1	2
Product is GM/non GM	1	2
Product is organic	1	2
Where the ingredients were sourced	1	2
Where the product was made	1	2
Some assurance that the food was produced in a sustainable manner	1	2
Use-by-date or best-before-date	1	2
Heart Foundation endorsement	1	2
Quality assurance label	1	2
A hala'l or kosher food label	1	2

Finally, a few questions about yourself

25. What is your gender

1. Male
2. Female

26. Can you please indicate your age category?

1. 18-25 years
2. 26-34
3. 35-44
4. 45-54
5. 55-64
6. Over 65

27. Are all the people who reside in your household born in Australia?

1. Yes
2. No

If No, in which country (countries) were they born?

.....

Please continue

28. How often do you eat the following in your household?

Please qualify your answer on a 4 point scale where 1 is “never”, 2 is “on occasions”, 3 is “a few times a week” and 4 is “everyday”

Western cuisine	1	2	3	4
Middle East cuisine	1	2	3	4
Asian cuisine	1	2	3	4

29. How many people live in your household?

30. Do you have children (below the age of 18) in your household?

1. Yes
2. No

31. Within your household, who are the major consumers of bread?

Please qualify your answer on a 4 point scale where 1 is “not at all”, 2 is “not often”, 3 is “sometimes” and 4 is “regularly” and NA is “not applicable”.

Myself	1	2	3	4	NA
Spouse	1	2	3	4	NA
Kids	1	2	3	4	NA
Parents	1	2	3	4	NA
Others	1	2	3	4	NA
Please specify					

32. Are you or is any other member of your immediate household:

Please circle the appropriate response for EACH variable.

	Yes	No
Completely vegetarian	1	2
Mainly vegetarian (eat fish but not meat)	1	2
Vegan (do not eat products derived from animals)	1	2
Lacto vegetarian (eat eggs and dairy products)	1	2
Following a strict plan to lose weight	1	2
On a casual diet to lose weight	1	2
On a special diet for medical reasons	1	2
On a special diet due to allergies	1	2
On a special diet for religious reasons	1	2

Please continue

33. On a scale of 1 to 6 where 1 is “I do not agree at all” and 6 is “I agree a lot”, please answer EACH of the following statements. Please circle your response.

I disagree
a lot

I agree
a lot

I have a great interest in supporting more sustainable food production	1	2	3	4	5	6
I support those food businesses that are concerned about animal welfare	1	2	3	4	5	6
Good health and nutrition are more important than taste	1	2	3	4	5	6
I support local WA business	1	2	3	4	5	6
I prefer not to buy imported goods	1	2	3	4	5	6
I am concerned for the welfare of others	1	2	3	4	5	6
I am opposed to the use of genetically modified organisms (GMO) in food	1	2	3	4	5	6
I like to try new foods	1	2	3	4	5	6
I prefer to purchase foods that are quick and easy to prepare	1	2	3	4	5	6
Purchasing healthy and nutritious food is more important than convenience	1	2	3	4	5	6
Healthy eating reduces the risk of disease	1	2	3	4	5	6
I am always willing to pay a premium to secure the best tasting food	1	2	3	4	5	6
I exercise regularly	1	2	3	4	5	6

34. In which suburb/town do you live?

35. Please specify the occupation of the principal income earner in the household

.....

36. Can you please indicate your gross household income last year?

1. Less than \$6,000
2. \$6,001- \$30,000
3. \$30,001- \$75,000
4. \$75,001- \$150,000
5. More than \$150,001

For and on behalf of the Curtin University, many thanks for your assistance.

Appendix 2.1: Map of suburb profile



Postcode	Frequency
3058	1
6000	8
6004	1
6005	2
6006	1
6007	2
6009	1
6010	6
6011	12
6012	2
6014	1
6017	2
6018	1
6021	19
6025	1
6027	1
6030	1
6050	4
6051	8
6052	6
6053	3
6055	2
6056	1
6059	3
6060	13
6062	7
6063	2
6066	5
6069	1
6100	4
6101	8
6103	7
6104	2
6107	10
6108	1
6110	9
6112	2
6124	1
6147	5
6148	25
6149	33
6150	13
6151	18
6152	1
6153	19

6154	6
6155	29
6156	7
6157	1
6158	1
6159	1
6160	7
6162	8
6163	38
6164	3
6168	2
6169	1
6172	2
6210	1
6230	2
6285	1
6315	1
6477	1

Appendix 2.2: Occupation

Retired	N	White Collar	N	Blue Collar	N
Retired	54	Chemical Engineer	1	Night Filler	1
Pensioner	9	CEO	1	Supermarket Checkout IGA	1
Total	63	Engineer	28	Social trainer	1
		Professional Worker	1	Storeman	3
		Financial Planner	1	Student	3
		Accountant	10	Social worker/community worker	5
		Database administrator	2	State public servant	2
		Business/shop Owner	12	Shopkeeper	1
		Manager/management	22	Builder/tiler	6
		Public Servant	3	Customer service	1
		Self employed	9	Driver	1
		Developer	1	Mechanic	3
		Consulting Engineer	1	Mining	6
		Building Manager	1	Fitter and turner	3
		Financial Advisor	2	Labourer	2
		Architect	2	Carpenter	1
		Teacher	19	Community service	1
		White Collar	N	Blue Collar	N
		Director	4	Community health worker	1
		Health Department	1	Electrician	5

		Proprietor	1	Unemployed	2
		Truck Driver	4	Farmer	1
		Transport	2	Retail	1
		Computer Technician	3	Seafarer	1
		Trainer and assessor	1	Forklift operator	1
		Shoe repairer	1	Wheat spray contractor	1
		Customs Manager	1	Cabinet maker/carpenter	3
		University Lecturer	4	Plant operator	1
		Executive assistant	1	Machinist	1
		Local Government officer	2	Food distributor/supplier	1
		Clinical supervisor	1	Housewife	2
		Health care community coordinator	1	Construction worker	2
		Health and safety advisor/professional	2	Total	64
		Veterinarian	2		
		Geologist	2		
		Semi-retired accountant	1		
		Logistic manager	1		
		Administration/secretary	5		
		Procurement Officer	1		
		Real estate agent	3		
		School officer	1		
		Education	1		
		Self-funded retired engineer	1		
		Sales director	1		
		Retail manager	2		
		Medical practitioner	2		
		Nurse	9		
		Academic	1		
		Personal assistant	1		
		Web designer	1		
		Clerical	1		
		Compliance officer	1		
		Scientist	4		
		Business analyst	1		
		Communications manager	3		
		Librarian	3		
		Solicitor	1		
		White Collar	N		
		Project manager	3		
		Student advisor	1		
		Venue manager	1		

		OHS professional	1		
		Psychotherapist	1		
		Office worker	3		
		Sales	3		
		Human resource director	1		
		IT executive/specialist	2		
		Consultant	3		
		Supervisor	2		
		Broker	2		
		Coal mine medic	1		
		Assistant	1		
		Surveyor	1		
		Businessman	4		
		Geologist	1		
		Interpreter	1		
		Executive officer	1		
		Client services manager	1		
		Health	3		
		Marine safety officer	1		
		Naturopath	1		
		Finance	1		
		Occupational therapist	1		
		Doctor	1		
		Geophysicist	1		
		Journalist	1		
		Ambulance	1		
		Online communication advisor	1		
		Hospitality professional	1		
		Finance executive	1		
		Factory manager	1		
		Technical consultant	1		
		Writer	1		
		Research scientist	1		
		Dental technician	1		
		Clerk	1		
		Marketing manager	1		
		Total	249		

*where N represents frequency

Appendix 2.3: Country

Caucasian	Frequency	Asian	Frequency
America/USA	11	Asia	2
Australia	22	Chennai	1
Austria	1	China	1
Britain	2	Fiji	1
Canada	4	Hong Kong	3
Channel Isles	1	India	10
Chile	2	Indonesia	1
Denmark	1	Iran	4
England	20	Kenya	2
Europe	1	Korea	1
France	5	Malaysia	21
Germany	3	Mozambique	1
Greece	2	Pakistan	2
Holland	2	Philippines	3
Ireland	7	Portugal	2
Italy	7	Singapore	6
Ivory Coast	1	South Africa	7
Jersey	1	Sri Lanka	4
Netherlands	1	Taiwan	1
New Zealand	19	Thailand	2
Scotland	4	Timor-Leste	1
Seychelles	1	Vietnam	2
Spain	1	Zimbabwe	3
Sweden	1	Total	81
Tomago	1		
UK	29		
Trinidad	2		
Total	152		

Appendix 2.4: Factors Influencing Choice

Reason	Total
Type of bread	
type of bread	38
brown bread	3
white bread	8
wholemeal	28
multigrain	16
grain	16
fruit loaf	2
rye	6
sour dough	2
good mix of grains	3

wholegrain	8
with walnut	1
chia	3
matured bread	1
yeast free	5
Price	
price/cost/value	161
value for money	5
cheap	1
on special/discount	7
Freshness	
freshness	112
date	1
expiry date	9
shelf life/how long it lasts	14
appearance	11
taste/flavour	77
freezability	1
not too dry	1
light, fluffy loaf	1
crusty loaf	5
aroma	1
Location	
close to shop/convenience	18
availability	7
Health	
healthy /health	62
wholemeal is good for you	1
multigrain bread as it is healthier	1
nourishing/nutritious	13
nutritional content/nutritional value	15
added vitamin	2
omega 3	1
fibre content	21
ingredient/content	26
buy bread recommended by diabetic association/health tick	2
not touched by hand	1
low fat/calories	4
no sugar	2
easy to digest	1
low carbohydrate/sugar	2
natural ingredient/not processed	3
no preservative/additives	30

gluten free	11
low GI	6
low salt	2
Brand	
quality	48
consistency	1
brand	29
smaller bakeries/bakery shops	2
supplier/who made it	3
maker	1
familiarity/previous experience	2
previous experience	3
packaging	10
Preference	
like chilli/sweet	1
what I feel like at that time/type of meal	26
type I like/variety/preference	6
cater for family/friends taste	14
children liking it	8
texture	24
softness	12
firm bread	1
solid, not doughy	1
small loaf	1
number of slices/quantity	5
heavy bread/loaf (weight/size of loaf)	13
thickness of slice	22
not big squares	1
organic	6
dairy free	1
produced sustainably	1
interesting	1
sliced	9
snack food	2
less flour and seed topping	1
new variety	1
No GM	2
Origin	
origin	3
ingredient from Australia/WA	3
local made/made in WA	20

Appendix 2.5: Reason for inadequate level of certification

	Total
No interest/Not sure	
don't know	8
don't know much about this area	9
don't care	2
don't bother at all/not a big issue for me	3
not sure, don't monitor that level	4
not interested	2
unsure/not sure/don't understand	5
Marketing tool	
gimic b the sale side/marketing tool	4
advertisement for sale	1
no idea of the validity	3
who can check its veracity?	1
you can pay for it	3
do not know who, what, where they are from and what company support private/gov	3
no income or support for farmers	1
don't trust logo	6
No education/recognition	
not familiar with logo/meaning	18
no education/ inadequate education of customer	11
don't know what it means/what they are	15
couldn't identify any/don't recognise any	11
do not understand the labels	2
public needs to be educated what pictures mean	15
can only recognise a few	5
how do you know what it means if not advertised?	2
not enough promotion/information on logo	15
not seen enough	3
need to raise my awareness and look for the logos/don't pay attention to logos	4
Standardised Accreditation	
our food laws are not strict enough/not regulated	9
understand how the company certify - farmer, food processor, manufacturer and what is involved	0
would like to know the accreditation process/certification	3
don't understand the standard of certification/accreditation	10
needs under a quality assurance standard	2
Symbols not clear	
don't notice the symbols	8
should stand out more	4

not large enough signs	9
need to be clearer/confusing	11
not clear	1
too many logos which is misleading	2
too many logos	7
Labelling	
would like to know if made and produced in aus/don't indicate country of origin, origin	2
imported ingredients where and what %	1
not all products are labelled	1
although it is said product of AUS, it may be ingredients from overseas	3
only look for made in Aus sign	1
need to label if GM	1

Appendix 2.6: Meaning of 'Sustainable Farming Practices'

	Total
Nothing	
nothing	14
don't know	17
no idea	16
?	3
don't bother	2
don't think about it/never thought about it	7
Good for community	
farmers given fair price	1
more awareness given to community	2
animal welfare	5
improved yields and productivity	5
technology to seed and harvest	3
farmer welfare/worker welfare	4
no negative consequence for ppl/nation outside of Australia	1
retain good quality wheat instead of exporting	1
ability to use output of farming	1
more jobs	2
support local farmer, better wage for farmers	31
sustainable for farmer, environment and consumer	6
Good for environment	
farmland protected from degradation/protecting the land for degradation	33
resting the soil/allow soil to stay good/maintain soil quality	19
taking steps to prevent salinity	16
prevention of erosion	10

long term outlook	1
ecologically friendly/environmentally friendly/not harmful to environment	35
farming practices that sustain over the years in regards to external changes	1
all farming is sustainable with fertiliser	1
preferred farming practices/efficient farming practice/better farming practices	24
conservation	2
reduce waste and recycling	11
more trees planted	4
efficient use of resources	24
less impact	1
waste management	1
use phosphate fertilisers/adding phosphate into soil	2
maintaining nutrient in soil	1
minimum tillage	1
support ecological sound development	1
earthworm farming decompost	1
consider proper use of energy, water, inputs/resources last longer	4
taking care of future generations - any detrimental effects	1
ensure farm can continue/allow farmers to produce now and still able to produce in years to come	19
produce food in manner that does not damage the environment/land, good for environment, not harmful to environment/care for the environment	24
allow crop growth for future generation	4
important	4
ability to use the paddocks again, not deplete the goodness from the soil	3
good for soil and longevity of industry	4
farming for the future/ensure land is available for future use	32
replant and reuse land/efficient use of land/caring of land	28
don't destroy natural surrounding and habitat	7
don't kill living creature in soil	2
don't pollute	1
not stressing soil/overusing the land	5
responsible use of ground and golden minerals/look after ground	2
use many varieties of grain - rotating crops/variety crops	21
not left with huge tracts of unusable land	2
better management of growing	6
no deforestation/clearing of land	12
less fuel	2
less water/efficient water use/reuse waste water	60
adjust to local climatic conditions, drought	2

use renewable resource	4
less environmental impact/pollution	22
reduce toxicity and chemicals used/less pesticide use	57
the future of agriculture	19
less carbon footprint	10
does not destroy ozone layer	1
Heath	
encourage farming and good job for fresh product but worried about pesticide	1
not producing GMO	17
better quality food which leads to good health	8
organic/organic use	14
sufficient nutritional value	1
less fertiliser	11
Support Local Product	
WA products are better	4
better produce and sold locally	3
buying local produce	3
advertisement of milk - locally made	0
Australian made	1
Interest in food standard and safety	
available/appropriate food standard	2
being the consumer, we need to know what we are eating	1
safe for consumer	1
makes me feel confident when purchasing such product	1
food travelling distance not good for environment - chemicals and freshness	6
Price Concerns	
cost more	2
marketing	1
government subsidies to encourage sustainable farming	1
consistent price	3
consumers have to pay more	1
farming with lower farming cost/cost effective	2
economic sustainability	1
commercially viable	1
keeps regular income for people concerned	1

Appendix 2.7: Correlation

Correlations															
		Product Information	Price sensitivity	Bread characteristics	WA sustainable	Health	Preference	Product Chemicals	Health values	Allergens	Sustainability	Support WA	Environment	Community	Financial
Product Information	Pearson Correlation	1	.245**	.222**	.462**	.272**	.202**	.312**	.258**	.275**	.403**	.178**	.108*	.137**	.131*
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.036	.007	.011
	N	387	382	382	385	373	381	381	383	385	371	386	379	381	378
Price sensitivity	Pearson Correlation	.245**	1	.251**	.126*	.047	.316**	.005	.151**	.029	.046	.004	-.021	-.020	.032
	Sig. (2-tailed)	.000		.000	.014	.366	.000	.927	.003	.577	.375	.932	.681	.692	.541
	N	382	385	381	383	373	382	379	381	383	369	384	377	379	375
Bread characteristics	Pearson Correlation	.222**	.251**	1	.271**	.240**	.355**	.211**	.195**	.203**	.128*	.045	.144**	.099	.059
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.014	.377	.005	.054	.255
	N	382	381	385	384	372	380	379	381	383	368	384	376	378	375
WA sustainable	Pearson Correlation	.462**	.126*	.271**	1	.397**	.197**	.579**	.365**	.354**	.524**	.537**	.223**	.251**	.248**
	Sig. (2-tailed)	.000	.014	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

	N	385	383	384	388	374	382	382	384	386	371	387	379	381	378
Health	Pearson Correlation	.272**	.047	.240**	.397**	1	.166**	.477**	.519**	.389**	.345**	.259**	.305**	.162**	.164**
	Sig. (2-tailed)	.000	.366	.000	.000		.001	.000	.000	.000	.000	.000	.000	.002	.002
	N	373	373	372	374	376	373	370	372	374	359	375	368	371	366
Preference	Pearson Correlation	.202**	.316**	.355**	.197**	.166**	1	.153**	.225**	.109*	.127*	.107*	.082	.072	.029
	Sig. (2-tailed)	.000	.000	.000	.000	.001		.003	.000	.034	.015	.037	.114	.164	.575
	N	381	382	380	382	373	384	378	380	382	369	383	376	378	374
Product Chemicals	Pearson Correlation	.312**	.005	.211**	.579**	.477**	.153**	1	.580**	.544**	.529**	.438**	.292**	.271**	.244**
	Sig. (2-tailed)	.000	.927	.000	.000	.000	.003		.000	.000	.000	.000	.000	.000	.000
	N	381	379	379	382	370	378	386	384	384	368	385	377	379	377
Health values	Pearson Correlation	.258**	.151**	.195**	.365**	.519**	.225**	.580**	1	.449**	.365**	.237**	.277**	.267**	.230**
	Sig. (2-tailed)	.000	.003	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000
	N	383	381	381	384	372	380	384	388	386	370	387	379	381	379
Allergens	Pearson Correlation	.275**	.029	.203**	.354**	.389**	.109*	.544**	.449**	1	.378**	.183**	.198**	.119*	.203**
	Sig. (2-tailed)	.000	.577	.000	.000	.000	.034	.000	.000		.000	.000	.000	.020	.000
	N	385	383	383	386	374	382	384	386	390	372	389	381	383	380

Sustainability	Pearson Correlation	.403**	.046	.128*	.524**	.345**	.127*	.529**	.365**	.378**	1	.541**	.264**	.294**	.162**
	Sig. (2-tailed)	.000	.375	.014	.000	.000	.015	.000	.000	.000		.000	.000	.000	.002
	N	371	369	368	371	359	369	368	370	372	374	374	366	367	364
Support WA	Pearson Correlation	.178**	.004	.045	.537**	.259**	.107*	.438**	.237**	.183**	.541**	1	.232**	.224**	.125*
	Sig. (2-tailed)	.000	.932	.377	.000	.000	.037	.000	.000	.000	.000		.000	.000	.015
	N	386	384	384	387	375	383	385	387	389	374	391	382	384	381
Environment	Pearson Correlation	.108*	-.021	.144**	.223**	.305**	.082	.292**	.277**	.198**	.264**	.232**	1	.559**	.285**
	Sig. (2-tailed)	.036	.681	.005	.000	.000	.114	.000	.000	.000	.000	.000		.000	.000
	N	379	377	376	379	368	376	377	379	381	366	382	383	380	377
Community	Pearson Correlation	.137**	-.020	.099	.251**	.162**	.072	.271**	.267**	.119*	.294**	.224**	.559**	1	.205**
	Sig. (2-tailed)	.007	.692	.054	.000	.002	.164	.000	.000	.020	.000	.000	.000		.000
	N	381	379	378	381	371	378	379	381	383	367	384	380	385	378
Financial	Pearson Correlation	.131*	.032	.059	.248**	.164**	.029	.244**	.230**	.203**	.162**	.125*	.285**	.205**	1
	Sig. (2-tailed)	.011	.541	.255	.000	.002	.575	.000	.000	.000	.002	.015	.000	.000	
	N	378	375	375	378	366	374	377	379	380	364	381	377	378	382

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

